THE PRIMARY CURRICULUM

F. H. HAYWARD, D. LIT., M.A., B. Sc.

RALPH, HOLLAND & Co.

Digitized by the Internet Archive
in 2007 with funding from
Microsoft Corporation

http://www.archive.org/details/primarycurriculu00haywuoft

THE EDUCATIONAL SCIENCE SERIES.

VOLUME II.

THE PRIMARY CURRICULUM.

First Edition, February, 1909.
Reprinted, April, 1909.

Educat.
Teach.
H

The Educational Science Series.

THE PRIMARY CURRICULUM.

EDITED AND IN PART WRITTEN
BY
F. H. HAYWARD, D.Lit., M.A., B.Sc.
INSPECTOR OF SCHOOLS UNDER THE LONDON COUNTY COUNCIL.
AUTHOR OF "THE MEANING OF EDUCATION," "THE SECRET OF HERBART,"
"THE EDUCATIONAL IDEAS OF PESTALOZZI AND FRÖBEL," ETC.

1005.29
15/2/10

London:
RALPH, HOLLAND & CO.,
TEMPLE CHAMBERS, E.C.

1909.

"Mankind continually educates itself through the circle of thought which it begets."—HERBART.

"I cannot too strongly urge you to acquire a habit of thinking of your pupils in associative terms . . . thinking of them (however else you may think of them besides) as so many little systems of associative (apperceptive) machinery . . . You will be astonished at the intimacy of insight into their operations and at the practicality of the results which you will gain. . . . Types of character are largely types of association. . . .

"If you wish to ensure the interest of your pupils there is only one way to do it; and that is to make certain that they have something in their minds *to attend with* when you begin to talk. That something can consist in nothing but a previous lot of ideas."—PROFESSOR JAMES, *Talks to Teachers.*

"To this day the majority . . . still fail to grasp completely the Herbartian truth, the fact that every human soul moves within its *circle of ideas*, resisting enlargement, incapable indeed, if once it is adult, of any extensive enlargement, and that all effectual human progress can be achieved only through such enlargement. Only ideas cognate to the circle of ideas are assimilated or assimilable; ideas too alien, though you shout them in the ear, or thrust them in the face, remain foreign and incomprehensible."

MR. H. G. WELLS, *New Worlds for Old.*

"We are our ideas, and cannot be separated from them."

PROFESSOR J. ADAMS, *Moral Education Congress*, 1908.

CONTENTS.

		PAGE.
Editorial Note		vii.
Chapter	I.—Introduction	1
Chapter	II.—Religious and Biblical Instruction ...	9
Chapter	III.—Civic Instruction	25
Chapter	IV.—Moral Instruction	31
Chapter	V.—English Literature—	
	I. Introductory	43
	II. Reading Books	47
	III. Elucidation of Meaning	49
	IV. Literature and Moral Instruction	57
	V. "Expressiveness"	59
	IV. Prosody and Style	66
	VII. Recitation	68
	VIII. Concluding Notes on Literature	80
Chapter	VI.—History	83
Chapter	VII.—Geography	105
Chapter	VIII.—Natural Science—	
	I. General Principles...	129
	II. Physiology and Hygiene ...	133
	III. Astronomy	138
	IV. Geology and Meteorology ...	140
	V. "Nature Study"	142
	VI. Chemistry and Physics	160

Chapter IX.—Songs as Knowledge Links 185
Chapter X.—Expressional Subjects—School Gardens 206
Chapter XI.—The Teaching of Drawing 216
Chapter XII.—Manual Training... 248
Chapter XIII.—Needlework 277
Chapter XIV.—The Language Arts—
I. Reading Methods 296
II. The Reading Lesson 313
III. Spelling 319
IV. Writing 321
V. The Physiology of Reading and Writing 323
VI. Speech and Composition 326
Chapter XV.—The Language Arts (*continued*)—
VII. Elocution or Recitation 334
VIII. Phonetics 344
IX. English Grammar 349
X. Logic 358
Chapter XVI.—School Music—
I. The Function of School Music ... 362
II. Voice Training 370
III. Songs 380
Chapter XVII.—Historical Aspects of Mathematics ... 385
Chapter XVIII.—The Teaching of Mathematics 392
Chapter XIX.—A Dogma and a Dream 433
Appendix 439
Index 463

EDITORIAL NOTE.

It may be well to indicate the authorship of the various chapters of this book :—

Chapter IV., on "Moral Instruction," is, with the exception of the opening paragraphs, the work of Mr. F. J. Gould, well known as a pioneer in the teaching of this important subject.

The second half of Chapter VII., on "Geography," is the work of Mr. J. W. Page, F.R.G.S.

Section V. of Chapter VIII. is the work of Mr. M. W. Liston, Head Master of the "Stanley" L.C.C. School. Section VI. is by Mr. W. J. Saunders, B.Sc., Science Master at Marylebone Central School, who also contributes Chapter XVII, and Chapter XVIII. ("Mathematics"), and the Index.

Chapter IX. is adapted from a lecture by Mr. T. W. Greenstreet.

The second portion ("School Gardens") of Chapter X. is by Mr. H. Parsons, Head Master of Craven Park L.C.C. School.

Chapter XI. is the work of Mr. H. B. Madams, Art Master at St. John's Road Higher Grade L.C.C. School.

Chapter XII. is by Mr. H. W. Smith, L.C.C. Handicraft Instructor and Editor of *Manual Training*.

Chapter XIII. is the work of Miss B. L. Blackmore, Examiner of the London Institute for the Advancement of Plain Needlework.

Chapter XVI. is the joint work of Mr. H. Millward, of Hague Street L.C.C. School, and Mr. E. A. Tyler, of Marylebone Central School. Mr. Tyler also contributes two important sections to Chapter XV.

The remainder of the book is by the Editor, who has also contributed a few sentences to several of the above-named chapters, and has, conversely, profited much from suggestions of the other contributors. Mr. W. N. James has also helped in this way. Mr. Millward's interest in "local history" has influenced several pages of Chapter VI., and a hint dropped by Mr. F. J. Gould was responsible for the section on "Logic" in Chapter XV.

It would be invidious to select portions for special notice, but, in view of forthcoming developments of education along "expressional" and "motor" lines, the lengthy chapters on Drawing and Manual Training may deserve the earnest consideration of the reader. If such consideration is also asked for Chapters II., III. and IV., the reason is that almost all books on school management are silent upon the topics there discussed. Appendix II. on Nature Study Books and Apparatus has also been made specially copious, to serve as a practical guide to teachers wishful of developing this subject.

Perhaps one fact calls for special mention. With scarcely an exception, the contributors to this book have all been, or are at the present moment, practical teachers. They are not academic specialists whose pronouncements, even though educationally sound, suffer from lack of contact with the difficulties of the classroom. Their aim, starting from existent school practice, is to set forth how that practice can be helpfully modified along lines that are both sensible and progressive; in short, to improve, not to revolutionise, the curriculum. (F. H. H.)

CHAPTER I.

Introductory.

A well-known educationist who saw the following pages in proof said; "Twenty years hence it will all have to be done over again, but it is well in advance of contemporary practice." I agree with the former statement, and believe there is some truth also in the latter.

Events are moving rapidly, and even if the following pages represented the most scientific conclusions of modern pedagogics, expressed in the choicest of terminologies, in twenty years' time, or less, the sentiments and suggestions of the book would probably have an old-fashioned air. Sociology is on the march; problems of heredity, eugenics, and brain physiology, are rising into prominence; "formal training" is apparently doomed; a few inductions are beginning to appear amid the voluminous statistics of "child study." Yet there is scarcely a "school management" book in England that shows any trace of these influences, and the present book probably shows only a few, so deep and wide is the chasm between the practical educator and the studies that will ultimately revolutionise his work. Our scientists chatter about education, and our educationists chatter about science, but the chasm separates them all the time. I agree then, that "twenty years hence it will all have to be done over again," and done better. Yet, unless I thought there were some helpful and clarifying thoughts in this book, unless I thought it lay along the line of advance, I should not be responsible for it.

In the first volume of this series* a number of Herbartian concepts or categories were set before the reader, mainly in the words of Herbart himself.

It would be a great mistake to suppose that if all teachers in Britain were to become Herbartians to-morrow there would be any very obvious or striking changes in educational machinery. There would be some change, certainly, in our time-tables; there would be increased fluidity in our teaching, the notion of "correlation" being more prominent than at present (Vol. I., *pp.* 123-31); but the superficial observer would scarcely notice such things as these. "You are teaching much the same subjects as before," he would say, and he would be right.

Herbartianism, I would urge, is not so much a "new method" as a new way of looking at things. The Herbartian feels that with a certain alteration of stress and standpoint a new significance can be discovered in educational work. He believes that this alteration of stress and standpoint would be of great value. It would not represent the last word of educational philosophy; indeed, a thousand other alterations and developments will be called for as time rolls on and the laws of mental life are discovered and learnt; but he believes that even a fixed and rigid Herbartianism would be at least an improvement on any other existent educational theory, and that there is no reason why Herbartianism *should* be fixed and rigid, or why it should not keep itself open to educational truth coming from every quarter. This has happened in America; Herbartianism is there allying itself with all that is promising in the work of Fröbel and his followers.

Does the Herbartian desire to cultivate the various "faculties" of the child—memory, imagination, observation, invention, reason, will? He does, but he thinks it commonly a mistake to speak of these faculties as separate, or to keep their separateness very prominent in his curriculum and his

* *The Meaning of Education* (2s. net).

methods. He prefers, on the whole, a different set of categories altogether. He prefers to speak of "character," "interest," "apperception," and so forth, regarding these expressions as more helpful than those of the "faculty psychology." Consider, for example, the so-called "faculty of memory." What things do we remember best? Broadly, *the things we are interested in, the things that we can apperceive.* Consider the "faculty of observation." What things do we observe best? Broadly, *the things we are interested in, the things that we can apperceive.* Consider the "faculty of reason." What things do we reason about best? Broadly, *the things we are interested in, the things that we can apperceive.* So, too, with our other "faculties," including in particular the sacred faculty of *will.* Even this takes the direction of our "interests."

This difference of standpoint or of terminology has been adequately set forth in the first volume, and I do not propose to repeat here what can there be found. But it is necessary to summarise the purpose of the present volume, especially as it may have readers who are unacquainted with the first.

(1) The aim of education, according to Herbart, is "*character-forming.*"

(2) But character cannot be "formed" by any mere process of drill or habituation, though there is a place for this. Character is rooted in *ideas*; all action (*i.e.*, voluntary, conscious action) is "rooted in the circle of thought." Education must therefore *supply ideas* to the child, who possesses no ready-made conscience. [Indeed, we hear of significant attempts being made at the present time to build up "*health*," "*civic*," and other "consciences" in the community.] *Instruction*,* leading on to *insight*, is thus fundamentally important from the moral point of view.

(3) Its importance is also seen from another point of

* The word "instruction" is not altogether fortunate. Sometimes the teacher must supply materials and then let the child "instruct" himself. Sometimes, too, "suggestion" is better than "instruction" in the strict sense.

view. As we do not know the child's future vocation, our education must be many-sided; indeed, the expression "*many-sided interest*" seems, to a certain extent, an apt description of what the teacher should immediately aim at awakening. This is more especially obvious as "interest" is morally of the highest importance, and thus links itself on to the supreme category of "character-forming."

(4) But "interest" depends largely on "apperception"; and apperception implies the prior existence of ideas in the child's mind. Thus, again, education seems called on to supply ideas, and instruction is again seen to be important.

(5) A third way of looking at the teacher's task is to regard it as the giving of an "*æsthetic revelation* (*or presentation*) *of the universe*"; the introducing of the child to the two great worlds of Nature and Human Nature. But this is much the same as cultivating "many-sided interest," and leads us to the same end—"character-forming."

(6) A large amount of *correlation* must exist among the various school subjects if the full possibilities of "*apperceptive interest*" are to be realised.

(7) Where there are present any innate propensities to activity, construction, research, etc. (such as those emphasised by Fröbel), these should be employed by the teacher, for economy if for no other reason (they practically amount to ready-made "apperception masses"), provided the supreme educational categories are never lost sight of in a maze of mysticism. Practical work in the garden or at the bench may be a better way to teach "observation" of plants, etc., than the old-fashioned "object lesson"—better because appealing more strongly to the child's "interests." Thus Fröbel's "*self-activity*" links on hopefully to Herbart's "*many-sided interest*."

(8) Concepts, such as "discipline," "training," etc., should be estimated in the light of the supreme educational categories. "Formal training" is especially suspect, as it is based on the "faculty" psychology."

The most distinctive feature of the present volumes is that they expressly and explicitly make use of these Herbartian formulæ. Whereas Professor Welton, for example, speaks, in connection with early lessons on history, of "developing a living organ of learning—a kind of nervous system of historical knowledge," I shall speak of providing "apperception masses." The expressions mean the same, but there is an advantage in using the precise, unambiguous, technical terms with which Herbart has endowed pedagogics.

Another feature of the book follows from its Herbartian *motif*. The reader will note that the "*knowledge*" subjects come early in the book. I do not commence with a discussion of the methods of teaching reading, writing, or arithmetic; questions of mere skill, technique, or even "self expression," are postponed to the other parts of the book. Any person acquainted with the concept of an "æsthetic revelation" that confers "apperceptive interest" will see at once the reason for this arrangement. We teach reading not as an art valuable for its own sake but as an art valuable because it introduces our pupils to literature and thus to ideas. I do not wish to stress too much the distinction between subjects that feed the mind and subjects which merely exercise the mind or allow the mind to express itself, but I wish to stress it sufficiently to keep the Herbartian concept of education clear. No doubt, as Fröbel somewhere tells us, there has to be a kind of constant interchange between the "inner" and the "outer." The effort to "compose" leads us to recognise the inadequacy or confusion of our thoughts; the effort to "draw" leads us to recognise the need for further "observation." Broadly speaking, however, there is a difference of emphasis, though not of ultimate attitude between those who insist on a well-furnished mind—a mind rich in knowledge or ideas—and those who insist on "skill," "exactness," "power," and so forth.

"It is one thing," someone has cleverly remarked, "to have to say something; it is another thing to have something to say." The epigram is applicable all along the educational

line. The Herbartian insists that the child shall have "something to say"—in other words, a rich supply of ideas of Nature and of Man; he is then not very anxious, though he is reasonably concerned, as to the other matter. Conventional education reverses the order, and thus comes to "teach" composition, "teach" grammar, "teach" drawing, and "teach" arithmetic, more or less prematurely.

I realise, however, that if I consulted the canons of good policy, I should say nothing about Herbart. The teacher whose knowledge of educational doctrine is confined to Quick's book, feels resentment at having another "reformer" hurled at his head; and the hazy academician, who abhors the idea of *system*, finds a mild exhilaration in criticising "the Herbartians."* For the benefit of the inexperienced reader, I therefore think it well to mention two facts that have a bearing on past and, perhaps, future controversies.

The first is that the errors or weaknesses, real or alleged, of Herbartianism, have been set *forth in detail by the Herbartians themselves.*† This fact should be kept in mind by the student when he comes across future "criticisms." The Herbartians are quite conscious of the genuine difficulties of their system, of the existence of subtle problems of instinct, for example; and they look upon their own phrases ("apperception masses," "margin," etc.) as merely standing for rough approximations to truth. But as this is the only existent educational system possessing both lucidity and comprehensiveness, the Herbartian prefers to use it as a basis for his thinking until the advent of a better one; and, meanwhile, feels at liberty to add, modify, and reinterpret wherever necessary.

The second fact is that "critics" of Herbartianism seem surprisingly conscious of the value of the Herbartian

* "The Herbartians" appear to consist in England of four dangerous animals, Professor Adams, Dr. Davidson, Miss Dodd, and myself.

† There is a list of twenty of them in my *Student's Herbart.*

terminology. Mr. Keatinge talks quite freely of "fusion of ideas"; "massiveness of ideas"; a "mechanism" of ideas; a "margin of consciousness"; the "blocking," "checking," "contrariance," "inertness," and "latency" of ideas; of ideas overflowing into "action"; of the "energy" and "relative strength" of "ideas"; of ideas "impinging" upon others; of "subconscious ideas"; of the "centre of consciousness"; of ideas "shooting up" into consciousnes; of "centre-points" for "systems of ideas"; of ideas "producing interests"; and of ideas "tending to form character."* I assert that the employment of such purely Herbartian terminology proves the convenience, suggestiveness, or, at least, plausibility, of the Herbartian psychology. It seems a strange thing, therefore, that Mr. Keatinge should throw cheap sneers at Herbartians for "coquetting with outworn psychologies," while himself employing Herbartian terminology to a perfectly unexampled extent. A serious and even desperate flirtation is far worse than a mere "coquetting."

So much by way of warning. Herbartianism is come to stay; but the identity of its leading ideas may gradually and naturally be lost as the vitality of education becomes greater, and pedagogic knowledge grows. Meanwhile, when *jejune* "criticisms" of Herbart appear, let the reader ask the critic which of the above canons [(1) to (8)] is fundamentally fallacious; and when certain books come from the educational press, he will equally well recognise their origin. Reputations are going to be made in the next few years by authors employing, and perhaps disguising under new language, the leading Herbartian ideas.

That the present volume contains a scheme of educational thought and practice perfectly and harmoniously welded together, I do not claim. The contributions are distinct, and to reduce them to a uniformity of language and sentiment would be only doubtfully politic. Again and again the phrases,

* *Suggestion in Education.*

and perhaps the implications of the "faculty psychology" inevitably occur. Furthermore, there is some doubt whether the Fröbelian category of "self activity" and the Herbartian category of "many-sided interest" should not for the present be treated as separate categories, despite the fortunate closeness with which they often approach each other. In plain words, educational thought is in an embarrassing state of flux, and should be so treated. I should be inclined, indeed, to scatter the qualifying words "probably" and "possibly" over every page if, by that means, I could convey a sense of the condition of thought. All I claim for the present book is that, though obviously transitional between books based on the "faculty theory" and those books of the future that will be based on established psychological truth, it may prove to be more helpful than some of the former and will do nothing to retard the appearance of the latter. More particularly, the stress on the employment of "romantic," "heuristic," and "motor" interests should be noted, and the subordination of technique to subject-matter.

In twenty years' time the genuine revolution foreshadowed by Professors Dewey and Stanley Hall may be desirable; school work may follow an "occupational" scheme, and the various "subjects," now so isolated, may be subordinated to the demands of that scheme. The "open-air school" may especially hasten this. But prediction is always unsafe, and the present volume, by giving a certain place to the newer ideas on expressional and motor work, and by emphasising some of the directions along which correlation is possible, aims at being moderately "advanced" while being also emphatically "practical." (F. H. H.)

CHAPTER II.

Religious and Biblical Instruction.

It would be unwise to attempt the prediction of the course that mankind will take in the centuries to come with regard to the above subject. Democracy in all countries seems tending towards the "secularisation" of the schools; nevertheless, as educationists are agreed that "character-forming"* should be the aim of education, there is little likelihood that such elements as are morally valuable in our present systems will be ultimately excluded. A period of temporary exclusion is, however, conceivable; that is to say, education may be "secularised" for a number of years, either until the various Churches and parties are able to come to agreement, or until a "science of education" has become so authoritative that Churches and parties will no longer be able to interfere with the teacher, but will admit that he—once he has been equipped with psychology and scientific pedagogics—is the most capable judge of what is necessary for the child's moral health.

The Future of Religious Education.

As I suggested in Volume I. (*p.* 19), there is chaos and contradiction here as elsewhere in the educational world. I do not refer merely to the controversy that is normal and inevitable in non-specialist circles like the House of Commons,

* Or possibly "social efficiency"; some educationists think that the expression "character-forming" is too individualistic.

where some members contend that "dogma" is wholly unsuitable for children, being abstract and therefore unintelligible, while others contend that children "live on dogma," but to the conflict and contradiction among students of pedagogy themselves. On the one hand, we have the well-recognised principle that the teacher should proceed from the concrete to the abstract, from family relationships and duties, to other relationships and duties, including the spiritual,* and that formal creeds, even if unexceptionable as to their truth, are historically late, and should probably be late also in our scholastic work. On the other hand, we have the plain facts that children (notably about the age of four to seven) are highly imaginative and revel in mystery; that they will probably believe in fairies and goblins, even if we exclude the names of God and Satan from their vocabulary; and that such exclusion would therefore seem to be at best pedantic and at worst almost monstrous. To say that a child "lives on dogma" is far from true; to say that he "lives on mystery" is quite near the mark.

So far as I can venture on the task of prediction—and I hesitate greatly to do so—I would say that the schools of the distant future will probably avoid dogma but emphasize reverence and mystery. It certainly seems unpedagogical to make young children repeat formulæ in the highly technical language of catechisms and creeds; in scarcely any subject except religion, and to a far less extent geography and grammar, is such a method now pursued. But, on the other hand, if by means of hymns, attitudes, solemn silences, a suitable ritual, and the like, any sense of the greatness and mystery of the universe can be conveyed to the child, so that he may be preserved from a grey, material, commonplace view of existence—if this is possible (and I believe that it is)—then the school must and will undertake the task, and I can even

* 1 John iv. 20: "He that loveth not his brother whom he hath seen, how can he love God whom he hath not seen?"

picture, in the school of the future, children of all sects taking part in the functions here faintly outlined.

Something much more definite than this must be said upon the question of biblical instruction.

I do not believe that the Bible will be absent from the school of the distant future. Controversies about it will have died down, and it will be kept in schools, not as a concession to any one party or as a compromise between alternative proposals, but as a book with which every educated person ought to be familiar, the one great book that links Europe with the Oriental world.

The Bible.

The Herbartian has no hesitation here. If, as Herbart urged, there are strong reasons for including such books as the Odyssey in the education of the young on the ground of its representing the "childhood of the world" (Vol. I., *pp.* 142-8), the reasons for including portions at least of the Bible are far stronger. People familiar with the Bible are possessed of apperceptive resources almost incalculable; and such resources, if Herbartian doctrines mean anything, are of immense importance for the moral life. Matthew Arnold has expressed this truth in a passage that deserves to be learnt by heart. He speaks of "the immense importance in education of what is called *letters*; of the side which engages our feelings and imagination. . . . On our *schools for the people* (by this good German name let us call them) the power of letters has hardly been brought to bear at all. . . . Now, perhaps, it is less likely than ever to be brought to bear. . . . The natural sciences are in high favour, it is felt that they have been unduly neglected, they have gifted and brilliant men for their advocates, schools for the people offer some special facilities for introducing them; on the other hand, the Bible, which would naturally be the great vehicle for conveying the power of letters into these schools, is withdrawn from the list of matters with which government inspection concerns itself, and so from attention. . . . It is through the apprehension

either of all literature . . . or of a single great literature, or of a single great literary work, as a connected whole, that the real power of letters makes itself felt.

"Only one literature there is, one great literature, for which the people have had a preparation—the literature of the Bible . . . Zion and Babylon are their Athens and Rome, their Ida and Olympus are Tabor and Hermon . . .; these and the like Bible names can reach their imagination, kindle trains of thought and remembrance in them. . . . If poetry, philosophy, and eloquence, if what we call in one word *letters*, are a power, and a beneficient wonder-working power, in education, through the Bible only have the people much chance of getting at poetry, philosophy, and eloquence.

"One may talk for ever about the wonder-working power of letters, and yet produce no good at all, unless one really puts people in the way of feeling this power."*

The case for the retention of the Bible in schools is overwhelmingly strong, even if there were no such thing as "religion" in existence.

(1) It is the only Oriental work easily accessible to the modern world and capable of familiarising men with the names and to some considerable extent the history of the eastern nations and empires.

(2) Much of it is in the very highest style of literature; *e.g.*, Job xxxviii., Isaiah xl.

(3) Its poetical style, based on parallelism, is quite distinct from modern styles: a brief study of it thus enlarges one's notions of poetry.

(4) It is rich in episode and character.

(5) Its motives are, for the most part, intelligible to children.

(6) Its language, episodes, and characters have entered into all modern life, which remains largely unintelligible without a knowledge of them.

---

* *The Great Prophecy of Israel's Restoration*, pp. vi.-xii.

(7) Above all, it is rich in moral material, and thus helps to build up an "apperception organ" for the recognition of what is moral and what is immoral, and an interest in the former.

Nevertheless, to express whole-hearted sympathy with the retention of the Bible in schools is not to express agreement with the methods commonly adopted. From all parties comes a chorus of testimony that these methods are in need of enormous improvement. There is no doubt that the average Englishman scarcely ever thinks of regarding the Bible as a book possessing an intrinsic interest apart from religion; he is rarely or never found reading it for pleasure. Now, I contend that, by the use of proper pedagogical methods, the Bible can be made actually fascinating, and I believe that it is the mission of the educationists of Northern Europe to discover and set forth what those methods should be.

Need of Improved Methods. "Interest."

In the remarks that follow I shall concern myself with the Old Testament rather than the New, partly because the discussion of the former will not so closely trench on the personal religious convictions of the reader, and partly because the Old Testament lends itself better than the New to purely pedagogical treatment. It is a veritable library of literature of the most varied kinds—some suitable for the very young child, some for the older child, some intelligible only to the adult. Educationists of the school of Dr. Stanley Hall are especially emphatic in urging that the Old Testament is the "Bible of Childhood," while the New Testament standpoint—personal, reflective and spiritual, is peculiarly suitable for adolescence.

The lines along which the reform of scriptural teaching should proceed are very much the same as those that will be suggested under the heads of history and literature.

First, there should be correlation of our biblical selections with the facts of archæology, history, and geography. Palestine was situated midway between Egypt and Mesopotamia,

and thus became involved in the politics of each of those countries—the two centres of Oriental civilisation. The history of the later kings of Israel and Judah is a long record of the alternating predominance of these great powers. Palestine was the buffer-state of Egypt, and more than once was employed by that country to bear the first brunt of Assyrian or Babylonian attack. Hints of this are scattered throughout the prophetical books and the Book of Kings, and yet few people seem to realise the necessity for depicting the historical background which alone renders these books intelligible. Again, the geographical conditions of Palestine explain much of its history. Why did Israel fall in 722 B.C. and Judah not till many years after? Solely because Judah, a rugged, mountainous, and comparatively poor country, was off the main line of Assyrian attack. Absolutely wrong ideas of Palestinian geography prevail everywhere, the Promised Land being, for example, conceived as a plain broken by a few hills, instead of as the great limestone hummock that it is. Some day, when the value of the clay or sand model has been recognised, life will begin to stir in the dull frame of biblical teaching.

Correlation.

Next, there should be correlation among the biblical books themselves. I refer more especially to setting the prophetical writings in their proper background of historical narrative. When, in the *Book of Kings*, the reader comes to the reign of Jeroboam II., then is the time to refer to the *Book of Amos*; the prosperity of the reign receives its most vivid portraiture in the denunciations of the great puritan prophet. Hosea carries us a stage further—to the decline, and almost to the fall, of the northern kingdom. The fact that Isaiah, Micah, and Hosea were contemporaries—that they brooded over the same problems, one from the precincts of the Jerusalem court, another from the Palestinian lowland, and the third from some spot in the doomed northern kingdom—

this fact, and all it implies, is rarely recognised, either by teacher or taught.

Need I say that there should be a far more careful and psychological *selection* than at present seems usual? Plato's protest of over two thousand years ago against allowing children to receive unworthy ideas of the gods applies forcibly to many of the existent "syllabuses of biblical instruction." How is it possible to deal satisfactorily with such subjects as the plagues of Egypt, the conquest of Canaan, and much of the Elijah and Elisha narrative? On the other hand, the Joseph story, the David story, and many other portions of the Old Testament are admirable in almost all respects. In the upper classes of the school, lessons introducing selections from the prophets may be made an admirable vehicle for instruction in some, at least, of the duties of citizenship.

Improved Selection.

The word "selections" needs safeguarding. "Scrappiness" cannot be altogether avoided, and yet it is too often destructive of apperceptive interest. We need to give substantial portions of most of the brilliant books which we select for study—not half a dozen verses. And yet, how is this possible? By a combination, I think, of "extensive" and "intensive" methods. The teacher may very well *read* large portions to his class, and comment in an illuminating manner upon them; but only selections need be actually studied in detail. I can conceive of a teacher reading all the *Book of Amos* to his class, bringing out here an impressive climax, there a fine refrain, and here again a vivid image; and then consulting the class as to what passages might well be learned by heart or studied in greater detail. Needless to say, modern literature should be treated in the same way.

"Scrappiness."

I have often thought, too, that many splendid *illustrations* of natural phenomena—to say nothing of other phenomena—could be obtained from the Bible and introduced into the

other lessons. References to the constellations above, and to the animal, vegetable and mineral world below, are many and rich, more especially in the Book of Job.

Hebrew Poetry.

Another point demands earnest attention. The arrangement of our Authorised Version, with its numbered "verses," almost completely destroys the parallelism and the other peculiarities which distinguish Hebrew poetry. If only there could be issued a cheap school edition of the *Modern Reader's Bible* (edited by Professor Moulton), biblical teaching might at once take a great step forward. Again, occasional correlations with modern literature and music will enormously increase the interest in the Bible. *Possibly* (not probably) the difficulties of *Genesis* i.-iii. could be dealt with through the poetical medium of Milton; certainly the Samson story links on to Milton's *Samson Agonistes* and Handel's *Samson* (all three men became blind!); and the Sennacherib episode to Byron's rousing anapests. "See the Conquering Hero Comes"—one of the classical pieces that every school should teach as a matter of course*—suggests an historical epoch that would appear to be almost absolutely unknown to forty millions of English people—the epoch of the Maccabees. In a hundred ways—perhaps even under a system of "secular education"—whatever is really valuable in bible lore could be taught in our schools; and I suspect that the most perplexing portions could be quite successfully approached through literary or musical media. But I am dreaming dreams—a dangerous habit.

I conclude this chapter with two selections from a work I wrote some years ago, a work too full of faults to be ever reprinted, but, nevertheless, sound, I still believe, in most of its positive proposals.

* An interesting fact is that Handel's *Judas Maccabaeus* was first rendered in the year following Culloden; and the Duke of Cumberland was, in a sense, identified with the "conquering hero" of the Jews.

I showed how "patriotism" and "civics" could be taught by means of lessons on the Hebrew prophets.

'The Jews,' says Professor G. A. Smith, 'were a race who, although for the greater part of their history without a fatherland, have contributed more brilliantly than perhaps any other to the literature of patriotism, and that simply because, as Isaiah illustrates, patriotism was to their prophets identical with religious privilege and responsibilities.' Amid the mass of matter thus presented, the great difficulty is selection.

In truth, the difficulty is great because it has never yet been faced. But so rich is the prophetic literature in moral power and culture power that the bounden duty of educationists is to make use of it.

Let the teacher saturate his mind with the leading facts about the Assyrians, Babylonians, and Egyptians. Material is easily accessible. Among other sources, one ought specially to mention (because of its splendid pictures) the British Museum Catalogue. Then let us proceed :—

The Assyrians—cruel as the grave and apparently irresistible; utterly unscrupulous; they who flay alive or burn alive the monarchs who resist or revolt; they who seem devoid of all the finer moral traits*—this scourge of Asia is coming nearer! Terror seizes the kingdoms of Israel and Judah. Petty alliances are formed. Egypt offers aid. Shall we submit or resist?

But yet all the time luxury, drunkenness, land-grabbing, sale of justice, prevail in the two Hebrew kingdoms. The prophets denounce the evil around them; they see in the advancing Assyrian the vengeance of Yahweh.

It is absolutely impossible to treat the history of Israel and Judah apart from the politics of Western Asia. Palestine was the pivot on which the world then turned—the bone of con-

* Esarhaddon seems to have been an exception to the general rule. He released Manasseh from captivity, and afterwards voluntarily resigned his throne to his son, Asshur-bani-pal. Such traits were rare in the Assyrian emperors.

tention between Egypt and Assyria (or Babylonia). It was the battle-ground of the opposing powers. All this is specially obvious from the pages of Isaiah, and yet Isaiah, the greatest man and statesman between the Nile and the Euphrates, is a character *practically unknown to English people!* The almost infinite capacities of the prophetic period and the prophetic literature for *school instruction of the very highest order* seem never to have crossed the minds of managers and teachers—probably because of the neglect of these matters by *their* teachers.

I suggest several possible courses of study, and proceed to give a few detailed suggestions.

(1) One course might have *Amos* as centre, and extend from the first brush with the Assyrians to the fall of the kingdom of Samaria.

(2) Another might have the invasion of Sennacherib as centre and Isaiah as the great personality. It might also point forwards to the fall of Nineveh.

(3) A third might centre round the intensely interesting life of Jeremiah.

(4) A fourth might be devoted (as Matthew Arnold suggested) to the dazzling prophecies of the "second Isaiah."

THE AMOS COURSE.

(1) *Preliminary.* Briefly connect up with history of David—Map of Western Asia—Assyria, Egypt—Look at Palestine, just between!—Contact with Egypt (*1 Kings*, xiv. and *2 Chron.*, xiv.)—Ahab, an able King, successful against Syria (*1 Kings*, xx.)—Alliance with Phœnicia (*1 Kings*, xvi. 31)—Wealth (*1 Kings*, xxii. 39)—Revolt of Moab—*The Moabite Stone* (every teacher should know about this)—Battle of Karkara, details given by Shalmaneser; Ahab had supplied the alliance with two thousand chariots and ten thousand men; *First Contact of Israel with Assyria*—Elijah*—Decline of Israel after Ahab—Jehu's tribute to

* There is no object to be gained by entering minutely into the Elijah story. "It is difficult to treat it as pure history."—Miss Bramston: *Dawn of Revelation.*

the great King, as shown on the *Black Obelisk* (now in British Museum; fine photograph in guide-book)—These kings were no "myths"—Revival under Jehoash—Syria weakened—Brilliant reign of Jeroboam II.—Prophets Jonah, Amos, Hosea.

(2) *Course of Lessons Proper.* Read *2 Kings*, xiv. 23-9—Map—Brilliant reign of Jeroboam II.—Why?—Assyria engaged elsewhere—Jonah—The book of Jonah came *later*—Object of it? To teach cosmopolitanism—Allegorical.

Luxury of Jeroboam's reign—Injustice—Lying—Dishonesty—Drunkenness—Formalism—How do we know all this? From *Kings*?—No. From *Chronicles*?—No. From Amos and Hosea—Let us learn a little about them!

Almost the whole of the *Book of Amos* can be made interesting if the teacher be well read. Social conditions (ii. 8, 13; iii. 12-15; iv. 1, 4; v. 11-12, 21; vi. 4). But vengeance will come! (i. 3-ii. 16; v. 3, 27; vi. 14).

Simultaneous reading will be found a satisfactory mode of familiarising the ears with the poetry of *Amos*. This poetry is highly regular in form (see i.-ii. with its recurrent formula), and also highly dramatic (iii. 1-8) with many a fine climax (*e.g.*, v. 21-24, "But let judgment roll down as waters, and righteousness as a mighty stream"). There is no need for everything in the prophecy to be understood. But let the class *feel* its rush and rhythm.

(3) *Conclusion of the Course.* A few selections from *Hosea* i.-iii.—I wonder if Amos and Hosea ever met!—Decline of the Northern Kingdom—Anarchy; "All their kings are fallen" (*Hosea* vii. 7)—Shall we lean to Egypt or to Assyria? (*Hosea* xii. 1; viii. 9)—Tribute to Tiglath-pileser (*2 Kings* xv. 19)—Cuneiform inscriptions confirm—Conspiracy of Pekah—Alliance of Israel and Syria against Judah (*2 Kings* xv. 37; *Isaiah* vii. 1)—Isaiah as the rising statesman of Judah—Invasion of Tiglath-pileser—Death of Pekah—Inscriptions again!—Intrigues with Egypt—Warning of Isaiah (xxviii.), quoted centuries later by Cromwell before Dunbar—

Fall of Samaria—Sargon's own words: "The city of Samaria I besieged and took; 27,280 of its inhabitants I carried away," etc.

I cannot conceive of any material more truly "educative" than the above. How many lines of thought it opens up! How essentially modern are the problems it deals with! How rich as moral material and imagination material!

THE ISAIAH COURSE.

(1) *Preliminary.* Social conditions of Judah—Bribery, luxury, land-grabbing, drunkenness—The Assyrian terror—Cruelty of this nation (see above)—Coming nearer!—Homage to Tiglath-pileser 740 B.C.—Rise of Isaiah as prophet of social reform and national sanity—Early prophecies (chap. ii.-v.).

Contemporary weakness of Israel after death of Jeroboam II. (see above)—Alliance of Syria and Israel against Judah—Panic—Appeal to Assyria—Isaiah's protest (chap. vi.-ix.)—Homage—Assyrian records.

Egypt, watchful and jealous!

Fall of Samaria, 722 B.C. (see *Isaiah* xxviii. 1-7)—Sargon defeats Egypt at Raphia in the south of Palestine—Rivalry of Egypt and Assyria.

(2) *Course of Lessons Proper.* Accession of Hezekiah—Vassal to Assyria—Accession of Sennacherib—"A universal explosion"; revolt of Babylon, Judah, etc.—Intrigues of the Jews with Egypt while Sennacherib is busy with Babylon—*Isaiah* xxx. 1-5—Egypt was "a mighty promiser," but, as Isaiah saw, was divided against herself; "Egypt helpeth in vain and to no purpose; therefore have I called her Blusterer-that-sitteth-still" (*Isaiah* xxx. 7). Far better is a quiet policy. "In returning and rest shall ye be saved; in quietness and confidence shall be your strength" (xxx. 15).

Sennacherib's invasion, 701 B.C.—*Isaiah* i. and xxii.—Reign of Terror; the event so long dreaded is here at ast!—Burning cities—Jerusalem being fortified!—Fugitives

—Chap xxii. is a "pit of blackness" and represents (G. A. Smith) Judah "at the lowest ebb."

The actual events—Capture by Sennacherib of the coast towns—Siege of Ekron—Approach of an Egyptian relieving army—Defeat of the latter at Eltekeh near Ekron*—Corps sent to invest Jerusalem; "I shut up Hezekiah inside Jerusalem, his royal city"—Formalistic worship but no real manliness (*Isaiah* i. 11-15)—Let us hope in the Egyptians!—But that hope is dashed to the ground—Debauchery of despair; "Let us eat and drink, for to-morrow we die" (*Isaiah* xxii. 13).

Hezekiah sends to Sennacherib at Lachish and offers tribute (*2 Kings*, xviii. 13-16)—Isaiah had probably counselled submission to the inevitable—Confidence revives—Sennacherib breaks faith, and again orders surrender of city—Isaiah now inspires resistance, where formerly submission, for he has now a just cause—"In all the literature of patriotism there are no finer odes than those which it owes to him" (G. A. Smith)—Insolence and adroitness of the Rabshakeh who tries to seduce the people (*Isaiah* xxxvi.)—Isaiah counsels confidence (xxxiii.) His prophecies take a defiant tone; "Woe to thee that spoilest and thou wast not spoiled; and dealest treacherously, and they dealt not treacherously with thee"—The ambassadors have returned with the news of Sennacherib's perfidy; "The ambassadors of peace weep bitterly . . . he hath broken the covenant, he regarded not man"—Chap. xxxiii. was written "part perhaps on the eve of deliverance, part immediately after morning broke upon the vanished host."

The deliverance — Three independent records, that of Sennacherib himself (who never claims to have taken Jerusalem, and who evidently returned suddenly to his capital); that of Herodotus, who narrates an Egyptian story concerning field-mice, which destroyed the bow-strings, etc., of the

* There seems some doubt as to the actual outcome of this battle, as indeed that of Karkara.

Assyrians at Pelusium; thirdly, that of the Jews, who attributed their relief to the "angel of Yahweh." The Serbonian bog, near Pelusium, was notorious for its unhealthiness, and several armies have suffered from pestilence in its neighbourhood—that of Sennacherib, that of the Persians several centuries later, that of Justinian, and still later that of the Crusaders.

Joy of the Hebrews—Composition of *Psalms* xlvi. and lxxvi. Did Isaiah compose xlvi.?

(3) *Conclusion of the Course.* Trace rapidly the succeeding events: Prophecy of Nahum (a century later) dealing with the imminent fall of Nineveh—Assyrian sculptures illustrating lion-hunts, etc.* Why did Assyria fall? She was merely an empire of brute force—perhaps the most brutal empire that has ever arisen. Compare Napoleon. Kipling's *Recessional.*

Here we have genuine history dealing with Assyria, Egypt, and the neighbouring nations; geography; poetry; above all, biographical and moral matter of first-class quality. Isaiah is, perhaps, the finest of all exemplifications of patriotism. He was no jingo; for the greater part of his life he counselled peace and submission combined with moral and social reform. But when the foreign tyrant broke treaty, Isaiah was the inspirer of resistance. The whole story is matchless; yet, owing to the deficient knowledge of teachers, the muddled arrangement of the book of *Isaiah*, and the apathy with which "religious instruction" is viewed, our schools rarely do the subject even the faintest justice.

In the preface to the same book I used the following words, with which I close the present chapter. A certain provincial school board had suggested that teachers should give some "slight knowledge" of the geography of Palestine.

* In the British Museum Catalogue is a representation of one of Sennacherib's sculptures dealing with the siege of Lachish. Any teacher who knows his business will make use of auxiliaries of this kind. If he is in London he will call the attention of his pupils to the existence of such things at the museum. Above all, he will know such books as Professor G. A. Smith's work on Isaiah.

"'Slight knowledge!' The truth is that to make our biblical instruction effective, we want *copious* knowledge of geography, history, archæology, and criticism. Probably no elementary school in the country has more than one map of Palestine for its six or seven classes, and really good maps are nonexistent. I have never yet discovered a school which recognised the 'witness of the monuments,' though that 'witness' is startlingly interesting, and gives some support to orthodoxy. Consider such crass neglect along with another fact still more vital—that the Bible, albeit the greatest book, is also the worst arranged, worst printed, and worst illustrated book in the world. Need we wonder that 'religious instruction' is ineffective when we find *Deuteronomy* wedged between *Numbers* and *Joshua*; *Isaiah* after *Nehemiah*, and wholly separated from *Kings* and *Micah*; *Amos* after *Daniel*; *frequent* absence of all signs of poetical arrangement; *almost invariable* absence of pictorial illustrations; such an *invariable* absence of historical headings, capable of giving the reader an inkling into the circumstances of composition, that not a thousand laymen in the country know that *Isaiah* i. was probably the prophet's appeal to the nation, and *Isaiah* xxxiii. his defiance of Sennacherib, on the occasion of the state's hour of terror? It is in face of such difficulties that 'religious instruction' has to make its way.

But even with our badly arranged Bible we could have done something *if we had tried.* We could have sought to picture to our pupils that great drama—great as any in the annals of Greece and Rome—when the coast-road of Palestine shook beneath the chariots of Egypt and Assyria, and the two empires met in the fields of Philistia, well-nigh on the very site of Samson's fabled exploits; when, years later, Josiah fell at Megiddo, in vain loyalty to the dying empire which even the desperate conquests of Assur-bani-pal could not save from ruin; when the brief Syrian supremacy of Egypt yielded to the longer supremacy of Babylon, and the agony of the city

came, and with it perhaps the first thought of the Suffering Servant; and when, all this time, among the hills which looked down upon the coast road, great prophetic souls, seeking to preserve a tiny state from moral catastrophe, gazed upon the imperial conflicts with beating hearts.

I think I see our elementary schools—to which Greece and Rome must be for ever little more than names—realising the inspiration of this great story. I dream, like Matthew Arnold, that to the poor of England Isaiah may be a Demosthenes, and Jerusalem an Athens; and that the culture and consolation conferred by great literature may not be the monopoly of the rich."

But for the present we must go on "dreaming."

(F. H. H.)

CHAPTER III.

Civic Instruction.

Reference has already been made in the preceding chapter to the possibilities of teaching the "duties of citizenship" in connection with the Bible. We shall presently see that they may be taught also in other connections.

Whether, however, a definite school lesson should be assigned to "civics" is a doubtful matter. In the present state of the curriculum, with purely formal subjects like grammar, dictation, and copy-book writing, taking up several hours of the weekly time, such a subject can scarcely expect a hearty welcome. And yet this subject—once we have learnt how to teach it—appears to be among the most indispensable for a modern school. The Furies and the Pities must laugh at the notion of democratic government being established among nations uninstructed in civic principles. Plato lavished all his genius on the problem of the education of the ancient governor; a score of Platos are now needed to lavish their genius upon the problem of the education of the modern voter.

I shall assume, however, that the time is not ripe for the placing of "civics," as such, upon the time-table; that there are so many difficulties in connection with the plan as to render its adoption undesirable. Certainly, "The Life and Duties of a Citizen" has not often proved to be a successful

subject in evening schools. The reasons no doubt are (1) that the English race has an invincible objection to the discovery or enunciation of general principles, and prefers to live from hand to mouth, or from one passing prejudice or enthusiasm to another; and, (2) that subjects like history and literature, which would provide excellent illustrative material for instruction (or, at any rate, "suggestion") on civic matters, are among the worst taught subjects of the curriculum. My own belief is that civics can be made into a successful evening school subject in either of two ways; by being closely linked to history and literature, or by being treated in debating fashion, with the proviso that the leading debaters be carefully prepared for their task and tactfully superintended.

But, though the plan of formal day-school lessons may well be rejected, mainly on the ground that there are few people in England at present competent to give them, it is highly desirable that teachers should keep themselves alive to the civic aspects of the various subjects which they teach, and should even place themselves deliberately on the outlook for illustrative material. Such interest will ultimately prove to be useful in the elaboration of systematic and authoritative schemes, and, indeed, any teacher who is ambitious of worthy distinction in educational matters, and has not already specialised in some definite direction, might well devote attention to this important subject. Sooner or later, our modern democracies will have to educate themselves.

In the present chapter I give a few examples, taken from personal experience, of how our ordinary literature lessons may be made into media for the suggestion of civic ideas. Boys and girls will be found to be far more willing to "think" over these serious themes than over the meaningless pedantries which form the staple of our parsing and analysis. If we have to "teach boys to think," experience shows that the best method is to give them something worth thinking about.

Portia's speech on "mercy" in the *Merchant of Venice* contains the words :—

> "Earthly power doth then show likest God's
> When mercy seasons justice."

The usual treatment is to ask what "seasons" means. A better plan, I suggest, is to throw out the question, "Which is better, justice or mercy?" The class will answer unanimously, "Mercy." I would then ask whether that was Portia's opinion; and the class, or a few of the more intelligent members, will begin to reflect on the meaning of "seasons," and will come to the conclusion that a thing which "seasons" another is, after all, less important than that other. A reference to the dangers of indiscriminate "mercy" or "charity" will be now inevitable, as will also be the question whether "true" justice will not include "mercy" . . . The same play is full of problems of an equally interesting character, and it is my belief that even the briefest discussion of such matters makes impressions which, recalled years after, will help life in a hundred ways.

In *Julius Cæsar* we have, of course, Mark Antony's speech —full of suggestiveness with regard to the fickleness of any populace which is devoid of political principles, and thus at the mercy of any orator who can appeal to its emotions. The character of Brutus, too, is full of interest. In connection with it, I have sometimes asked a class for examples of the assassination of rulers (besides Julius Cæsar), and mention has perhaps been forthcoming of some anarchist outrage, such as that which resulted in the death of the King of Portugal (1908). Then the question of motives arises, and the class (of course) straightway condemns the anarchist. But the case of Brutus is an "arresting" one. For Brutus was no villain, though he was a regicide; and, after a little discussion, the class will admit that an anarchist who deliberately faces national execration, and almost inevitable

death, is not necessarily a vile man, though he may be a woefully mistaken one. The execution of Charles I. in the light of day, and the hired attempts at the assassination of Cromwell, are matters that will now almost inevitably be referred to. History and literature thus again become doorways to civic knowledge.

In *Coriolanus*, the chief theme is the conflict of autocracy with democracy. The hero's patrician pride, often verging on blatant prejudice, can be compared with the jealous attitude of the tribunal demagogues. Which party comes the better out of the conflict it is hard to say, the faults on both sides are so obvious. Any intelligent teacher will be sensible of the modern atmosphere which surrounds this story, though, in its first form, it is already over two thousand years old.

Tennyson's *Revenge* is a favourite school piece. The teacher may perhaps ask a class the question whether Grenville or Howard played the better part in the conflict of policy with which the poem opens. Another question is whether the sailors of any other country than England would have fought so bravely as Grenville's men. The class unanimously answers "No." Whereupon the teacher may well refer to *Westward Ho!* with its story of a Spanish ship deliberately going down with all hands (not even surrendering after a long fight, as was the case with *The Revenge*), and to events in the recent Spanish-American War. There is something unwholesome in the unanimity above referred to; it is so utterly foreign to the plainest facts of history and human nature.

While on the question of war, I would call attention to the *Biglow Papers* of James Russell Lowell. I hesitate to suggest their use in an ordinary elementary school, and yet, in exceptional cases, and more particularly, perhaps, in secondary and evening schools, there would seem to be a civic use for these poems, because of their utter

modernness in theme, sentiment, and significance. Who could put two sides of the war question better than they are put here:—

I.

"Ez fer war, I call it murder,—
There you hev it plain an' flat;
I don't want to go no furder
Than my Testyment fer that;
God hez said so plump an' fairly
It's ez long ez it is broad,
An' you've gut to git up airly
Ef you want to take in God.

II.

"'Taint your eppyletts an' feathers
Make the thing a grain more right;
'Taint afollerin' your bell-wethers
Will excuse ye in His sight;
Ef you take a sword an' dror it,
An' go stick a feller thru,
Guv'ment aint to answer for it,
God will send the bill to you."

III.

"In six months where'll the People be,
Ef leaders look on revolution
Ez though it wuz a cup of tea,—
Jest social el'ments in solution?
This weighin' things doos wal enough
When war cools down, an' comes to writin';
But while it's makin', the true stuff
Is pison-mad, pig-headed fightin'."

IV.

"Democ'acy gives every man
A right to be his own oppressor;
But a loose Gov'ment ain't the plan,
Helpless as spilled beans on a dresser:
I tell ye one thing we might larn
From them smart critters, the Seceders,—
Ef bein' right's the fust consarn,
The'fore-the-fust's cast-iron leaders."

The *Biglow Papers* also abound in references to the power of the press for good or evil—a question of increasing importance in these days, when American press methods are

increasingly apparent, and great "trusts" are controlling the newspapers and humbugging the unwary by bogus competitions, worked-up indignation, and the like.

> "I du believe with all my soul
> In the great Press's freedom,
> To pint the people to the goal
> An' in the traces lead 'em. . . .
>
> In short, I firmly du believe
> In humbug generally. . . ."

These few examples may serve to show that even in connection with the utterly inadequate "literature" of our present curriculum there may be opportunities for clearing up civic and political ignorance. Succeeding chapters on morals, history, and literature will serve to suggest—though all too faintly—the almost illimitable possibilities in this direction. Much, too, can be done by lessons on the great public buildings, the works of art, and the like, that surround us; and here, no doubt, the teachers of drawing and manual work can contribute their share to the problem of civic instruction. Ultimately, I doubt not, we shall take our pupils to see public institutions, such as courts of justice, in actual work.

Some readers will doubtless smile at certain of the suggestions here proffered. In a hundred years' time, the notion of teaching civics will no longer strike the imagination as absurd.

(F. H. H.)

CHAPTER IV.

Moral Instruction.

THE problem of how moral instruction may best be given has not yet been solved; its solution is just beginning.

In a separate work* I have shown (it hardly needed showing, one would have thought) that man stands in special need of moral instruction. Animals are equipped with definite instincts, which adequately provide for all the necessary acts of life. Man's instincts are much more indefinite, plastic, and dirigible, hence, unless instruction come to their aid, he will entirely fail in the struggle for existence and for nobility. Man's educability and plasticity are his most characteristic qualities; consequently, the common definition of education as a process of "drawing out" is singularly inappropriate.

The above is the biological argument in favour of moral instruction.

There is also a psychological argument. If all deliberate action "springs out of the circle of thought," the educator may rightly be called upon to provide the pupil with a "circle of thought"—that is to say, a mass of ideas and ideals—that may direct the pupil's action in right directions. No one can choose a course of action without, in the first place, having heard or known of such a course of action being possible, and, in the second place, seeing something reasonable,

* *Education and the Heredity Spectre.* Watts & Co., 1908. See also *The Secret of Herbart.*

or advisable, or attractive, in such a course. He must "apperceive" before he chooses.

Thirdly, there is an *à posteriori* argument. No less than eight independent proposals* for moral instruction on special subjects have been brought forward during the past few years —a clear proof that, in the opinion of many people, much evil springs from ignorance, thoughtlessness, prejudice, delusion, and other forms of intellectual defect.

Now, there is much controversy as to the exact form which moral instruction should take. In some schools definite lessons are assigned to the subject, in addition to those on religion. In others, attempts have been made to employ the scripture, or catechism, lesson for the purpose. In others again, the curriculum has remained unaffected by recent demands for moral instruction.

The whole question being surrounded by difficulty, I believe that the following section, contributed by a well-known authority on the subject, will prove most helpful and timely. I would only remind the reader that, despite the "five moral ideas," Herbart did not believe that conscience was a ready-made "faculty." It had to be developed, like every other "faculty," for it, like they, was "rooted in the circle of thought."

. . . . . (F.H.H.)

It is commonly said that the three elements of human nature are feeling, thought, and action; that feeling is the spring, and thought the counsellor of action; that action is the executive result of feeling and thought. In many respects the Herbartian conception of action as being "rooted in ideas"—or of ideas as passing into action through the medium of apperceptive interest—is a more helpful conception; for, even though "feelings" may be as truly fundamental as "ideas," there is no doubt that, apart from ideas, feelings are generally too vague to be effective; in a sense, the idea

* The proposals deal with kindness to animals, thrift, gambling, alcohol, tobacco, courtesy, patriotism, civics.

liberates the feeling. The Herbartian view has the advantage, too, of showing how "insight" enters into truly moral conduct, and lack of insight into much, or all, "immoral" conduct; many people forget this, and imagine that merely to bring up a child in excellent *habits* is enough.

In the present chapter, however, I shall speak of Feeling, Thought, and Action in the usual way, and shall expect my readers to translate my expressions, if they wish, into Herbartian language.

The Three Elements of Human Nature.

Feeling in its lower levels is selfish, or egoistic. In its higher levels it is affectionate or altruistic. Affection, or benevolence, is the motive of the truly civilised man. Affection, however, needs the control of thought, criticism, science. Neither affection nor intellect avails, unless it realises itself in deeds. The three elements of our nature are combined harmoniously and religiously in the precept which should regulate the good citizen and the good State—*act from affection, and think in order to act*.

Aim of Moral Instruction.

To teach the young to act on this noble precept is *moral education*. To teach them to understand it, and to desire to carry it out, is *moral instruction*. All education should have a moral aim; that is, it should aim at evolving good character, good will, so that the young man or woman shall sincerely resolve to minister to the welfare of others. In Bernardin de St. Pierre's prose-poem of *Paul and Virginia*, the old man who unfolds the tale reaches the point where Virginia sails for France, and leaves Paul on the island, and then he adds:—

> "Paul begged of me to teach him to read and write, in order that he might correspond with Virginia. He afterwards wished to obtain a knowledge of geography, that he might form some idea of the country where she would disembark; and of history, that he might know something of the manners of the society in which she would be placed."

Allowing for the romantic exaggeration, this passage suggests the beautiful direction which is given to every study, when it is undertaken with the motive of devotion. The goal of the school discipline of body, mind, and heart should be efficiency in social service.

True Aim of Education.

Moral instruction (of which alone I write in the remainder of this chapter) is the "logic" of moral education. It is training of the feeling, imagination and judgment. Of this instruction there are two kinds, direct and indirect. The subjects treated in moral instruction, though vital in importance, are not many in number, and they are practically embraced under the headings of Self-control, Truthfulness, Kindness, Industry, Duty, Honour, Justice, and Co-operation, or mutual aid. In all lessons on these subjects, the teacher should try to kindle noble feeling, arouse right thought, and direct the will towards good action. Since the end is action, and action is best understood by human and historic examples, the moral lessons should mainly consist of the presentation of such examples drawn from experience, biography, poetry, folk-lore, etc. But, whatever material is used, the lesson will obviously lead up to some ethical point or climax. Take, for instance, a lesson which I have sometimes given to children (aged eleven or twelve) on gratitude. Here is its framework:—

Two Kinds of Moral Instruction.

Direct.

(1) The story of a Persian king who amply rewarded a peasant's gift of water by a cup filled with gold.

(2) Fable of a Russian countryman, who, being saved from a bear by a companion, grumbled at his deliverer for spoiling the bear's skin by driving a hayfork into it.

(3) Anecdote of George Stephenson, who, after many years, repaid the kindness of an aged couple.

(4) Douglas Jerrold has a flower given to him as a boy, and never meets the giver again; but he spreads the sweet

influence of the act by recounting it to friends long afterwards. Thus, the spirit of gratitude may reach a wider circle than in cases of personal requital.

When this thought is impressed upon the imagination of the young listeners, the lesson has done its immediate work. It is direct moral instruction in the sense that the children are taught to appreciate an ethical idea. In a series of manuals* I have so amply illustrated this method that I may dispense with further instances, and pass to a brief study of the manner in which moral instruction may be indirectly imparted. Lessons in geography, history, literature, painting, wood-carving, cookery, music, mathematics, science, nature-study, etc., may all be made to subserve the purpose of character-building. Out of this mass of material I select the theme of History. Here, instead of drawing out a direct moral conclusion as the purpose of each lesson, the teacher follows the course of events, national or biographical, and indicates their moral significance in passing. He may secure this ethical object, and also reduce his data to simplicity and clearness, if he pursues the psychological division already indicated, namely, the three lines of feeling, intellect, and practical result in character.

Indirect, as, *e.g.*, History.

The three great phases of human development are Antiquity, the Middle Ages, and the Modern Period.

To children, the tale of antiquity is one of immense interest. Children are themselves partial repetitions of primitive man in their modes of feeling, thought and action. Like him, they are fetishistic; that is, they attribute life, emotion, and will to wooden or metal toys; they listen eagerly to tales in which animals talk and plot; they take it as natural when trees, rivers, clouds, flowers and stars converse and act. This is another way of saying that they love fairy-tales; and old fairy-tales are the literature of

Antiquity.

* "The Children's Book of Moral Lessons," 4 vols., and "Life and Manners."

young nations. Fairy-tales are folk-lore. In genuine folk-lore, we have a splendid store of the feelings and ideas of man in the savage and barbaric stages of culture. We must therefore have no history without folk-lore.* With this literature we should combine notes on early magic and religion. Magic exhibits man struggling with nature. In the very act of trying to outwit the forces of nature by spells primitive man learns by degrees the actual facts of the external world; in other words, science makes its first faint beginnings.† With religion are involved the moral laws, poetry, politics and social customs. For instance, the Old Testament displays both the religious ideas and the laws of the Hebrews; the "Book of the Dead" and other sacred writings of ancient Egypt acquaint us with the moral laws of the Egyptians; and the Code of Hammurabi, carved in arrow-headed letters on a stone pillar, records the laws of old Babylonia. To these studies should be added an examination of the arts and industries as illustrated in tools, weapons, clothing, ornaments, architecture, etc.

Feeling, Ideas and Action in Antiquity.

If already we seem overwhelmed with material, I pause to say that there is not the slightest need (educationally speaking) to cram the young learner with masses of information. The teacher should choose a few examples from each of three classes:—(1) Facts and stories which indicate the people's feelings, co-operation, respect for elders, family bonds, treatment of women and slaves, etc.; (2) facts and stories that indicate their ideas of the world and man, laws, poetry, etc.; (3) facts and stories that indicate their capacity for meeting difficulties, thrifty handling of produce, persistence amid trials, practical achievements in war, industry, travel, domestication of animals, etc.

Selection of Typical Facts and Stories.

* The publications of the Folk-lore Society either give the data or supply the necessary guidance.

† Consult the "Golden Bough" of Dr. J. G. Frazer, or such little manuals as Clodd's "Animism," Haddon's "Magic and Fetishism," etc.

The feelings, thoughts and practical abilities of the ancient Greeks are exemplified in the tales of the "Iliad" and "Odyssey." It might seem impossible to find place for Greek plays, but any intelligent teacher could easily tell the charming history of Antigone in a forty minutes' lesson. Smaller children will derive great pleasure and instruction from selected anecdotes from Plutarch's "Lives." Elder scholars will take interest in the family life, social customs, religion, science, arts, politics, conquests and colonisations of Greece and Rome, the intellectual strength appearing mainly in the civilisation of the Greeks, and the political and social in that of the Romans. Children can be readily led to appreciate four cardinal points in the moral drama of antiquity, namely, the struggle of early man to pass from the brute stage to that of humanity; the organised national life of China, India, Babylonia, or Egypt; the genius of Greece; the practical capacity of Rome.

The Greeks and Romans.

Moral Drama of Antiquity.

There is a class of folk-lore which belongs partly to antiquity and partly to mediæval times. I refer to the Icelandic sagas, Arthurian legends, tales of Welsh heroes in the "Mabinogion," and of Irish heroes in such collections as Lady Gregory's "Cuchulainn" and "Gods and Fighting Men." Some of the myths and ideas in these sources are pre-Christian, and should be noticed in lessons on ancient history. As the tales received an overlay of fresh fancy in the Middle Ages they should also be regarded as illustrations of the life of this second great period.

Folk-lore.

In this stage, as in the following stages, much of the material dealt with in the history lessons may be repeated in new connections in the lessons given under a scheme of direct moral instruction.*

* For the general life of primitive man see Tylor's "Anthropology" and works by Clodd and Lord Avebury (Lubbock); for religion, an excellent series of small manuals on "Religions Ancient and Modern," published by Constable.

The clues to the character of the Middle Ages are Feudalism and the Catholic Church. On the side of Feudalism the teacher can narrate the careers of Charlemagne, Alfred, Godfrey the Crusader, Joan of Arc, Chevalier Bayard, Saint Louis of France, etc. He can re-tell the Arthurian legend, recite the ballads of the Spanish Cid,* and make Siegfried and Kriemhild, proud Burgundians and furious Huns, live again in the reading of the "Nibelungenlied."† Many an example of self-sacrifice and generosity he can choose from the long conflict of Mussulman and Christian, whether in the Eastern Crusades or the Spanish wars.‡ He can mark the transition of the working-class from slavery to serfdom.§ On the side of Catholicism rich incidents may be drawn from the biographies of popes and monks, St. Francis of Assisi, St. Elizabeth, etc.; or from the lurid circles of Dante's "Inferno" or the transporting beauties of his "Purgatory" and "Paradise."‖ By means of pictures and descriptions the glories of cathedrals and other forms of Christian art may be unfolded. The teacher can avoid confusion if he will disclose the types of *feeling* illustrated by chivalry, noble women, peasants, saints; types of *thought*, illustrated by elementary accounts of Roger Bacon, the Arab philosophers, etc.; and types of *action*, illustrated by the best feudal lords, popes, trade gilds, etc.

The Middle Ages.

Mediæval Types.

With the aid of such types, again, we may trace our ethical course through the Modern Period.

By means of biography, dramatically sketched, we may bring into relief the moral influence of Wiclif, Luther,

* Translated by Lockhart.

† Translations by Lettsom and Horton.

‡ Vivid and instructive episodes will be found in Miss Yonge's "Moors in Spain" or Washington Irving's "Conquest of Granada."

§ How this may be done in one simple lesson is suggested in a chapter of Vol. IV. of the "Children's Book of Moral Lessons."

‖ Many scenes in Dante's "Divine Comedy" are quite unsuited to the child-psychology; but a general sketch of the poem may be given.

Loyola, Fox, Bunyan, Wesley, and other eminent figures of religious evolution. In spite of the diversity of these representatives, I am convinced that a judicious teacher could include such elements in history lessons without offence to the conscience of scholar or parent. The softening of manners, the amelioration of penal codes, and the rise of philanthropic enthusiasm in its specially modern sense (as in Howard, Owen, Shaftesbury, Lloyd-Garrison, Tolstoy, etc.) will provide ample topics which may be arranged according to the teacher's taste and interest. The poetry of Burns, Blake, or Wordsworth, or the tales of Dickens or Hans Andersen may reinforce this division of our study.

Feeling in the Modern Period.

When we come to scientific thought and the intellectual power of the artists in words, painting, marble, metal, etc., biography again is an important vehicle. In discussing the moral value of science teaching, a certain school of educationists will lay stress on the virtues of accuracy, veracity, and the like. In my opinion, the value of science should be mainly enforced through the lives of scientific workers.* The careers of Galileo, Newton, Davy, Darwin and others will be narrated, chronological sequence being scrupulously observed. The poets—Chaucer, Ariosto, Tasso, Shakespeare, Milton, Byron, Goethe—may be introduced to the children through the recital of some of their story-plots. Assisted by pictures, visits to galleries, etc., the imagination may be touched by the masterpieces of Angelo, Raphael, Titian, Wren and other artists. Sagacious observation of human nature may be exemplified by adaptations from Cervantes, Molière and Scott.†

Modern Thought.

Character, or the active element, may be considered in two aspects, political and industrial, using the terms in their broadest sense.

* From this point of view I should transfer such biographical aids to the science lessons themselves.

† Not necessarily in the formal history lesson. Literature and geography should, as far as possible, run parallel with the study of history.

(1) POLITICAL. A few illustrious types will suffice, such as Louis XI. (who is not quite justly treated in Scott's "Quentin Durward"), Henry of Navarre, Elizabeth, William of Orange, Cromwell, Frederick II., Washington and Lincoln. The moral aims of the truest modern statesmanship can be made explicit to children—national freedom and international co-operation, first in the Western peoples and their colonies and then in wider circles. Teachers should take extreme care to point out the difficulties of practical rulers, how they have to conciliate opposing forces (*e.g.*, Henry of Navarre confronted by the jealousies of Catholics and Huguenots), and how they have to courageously resist prejudices and vested interests, and persist under discouragements. The French Revolution, trade unionism, the broadening of the parliamentary franchise, the extension of local government, and the marked deepening of the sense of social responsibility,—all these features of the modern period should be treated through selected episodes and biography.

Modern Action: (1) Political.

(2) INDUSTRIAL. School and juvenile literature now teems with narratives of inventors, mechanicians, engineers, travellers, explorers, and captains of industry, and it would be superfluous to quote examples. But the mere detailing of discovery and achievement is of little value educationally. What needs supreme attention is the exposure of the true social ends of activity. Good will to man and the subordination of personal ambitions to the common welfare are the tokens of the noble industrial types. It is possible to relate the adventures of Captain Cook and yet miss the fact that he is an eminent instance of loyalty to the public service.

Modern Action: (2) Industrial.

Whether from the point of view of history pure and simple (if there is such a thing!) or of history as an unfolding of morality, it appears to me important that the school course should cover all the periods—ancient, mediæval and modern.

To the objection that the task is too gigantic for the elementary school I reply:—

(1) I should sweep away very much of the present useless detail of the manuals, and substitute *typical* details. For example, it is of little consequence to set out all the engagements of the English Civil War between King and Parliament. One or two scenes are enough to invest the subject with picturesque interest. It is of more importance to give graphic views of Milton, Bunyan and Defoe as types for whom the Commonwealth period prepared room and work in England. Again, a page or two descriptive of the educational genius of Diderot and his encyclopædia would throw more light into the young scholar's conceptions of progress than the long chapter of the Napoleonic wars, or a full chronicle of the campaign in the Crimea. I may say in passing that I should accustom the child to look at history rather in centuries or even larger areas of time. Charts and tables, in book form or otherwise, should be freely placed at the scholar's disposal, so that his energy could be devoted to fitting the framework with bright and significant pictures.

Types rather than Details.

(2) My object has been to suggest a general method rather than an actual plan for a specific series of lessons, and such a method, moreover, as will emphasize the moral factor in human evolution. The teacher might take the history of England or France or America, and treat it on the system here outlined. At each stage could be illustrated the state and growth of *feeling*, as evinced in family life, social customs and religion; the state and growth of *thought*, as evinced in the nature study (no matter how crude the science), poetry and art; and the *practical* genius, as evinced in forms of government in village or town, in labour and invention, in gradual mastery over the obstacles of the external world. You will trace the progress in each department—how the social

Method applicable to General History, National, etc.

sentiment in the days of Victoria was more humane than in the days of Anne; how thought was more free and more exact in the period of Darwin and Spencer than in the age of the Lollard burnings; and how social action has become so superior in organisation, as in the Post Office and the railway system, compared with the primitive modes of communication in the eighteenth century or the age of the Plantagenets. The teacher might even choose the history of a single town and apply the same method, so as to bring out the moral attitude of the citizens, their advance in learning and art, and their discipline in the task of self-government.*

(F. J. G.)

* The idea of proceeding on the lines of moral, intellectual and practical development is admirably embodied in Professor E. S. Beesly's charts of ancient and modern history.

CHAPTER V.

English Literature.

I.

INTRODUCTORY.

It is a significant fact that on the time-table of a Primary School one rarely sees the word "literature." One finds "composition," "reading," "recitation," and "grammar"; on exceptionally good time-tables one may find "English" taking the place of the last two; but of "literature" there is probably no mention at all.

Why is this? "A good book is the precious life blood of a master spirit, embalmed and treasured up on purpose to a life beyond life"; and whatever the advocates of nature study and manual subjects may say, one of the chief aims of education must be to "make children at home in the world of books."

Nothing can entirely take the place of this. A student of Nature who ignores books is ignoring the study of the highest being in Nature, the being who, in the course of ages, has overtopped mineral, and plant, and animal—the materials of "nature study"—and has achieved even greater things through research and imagination than by his hands—the organs involved in "manual" training. A celestial visitant on this earth a million years ago would have been a spectator of "Nature" in all her glory; a hundred or more milleniums

Significance of Books.

ago he would have seen man—a contemporary of the mammoth and rhinoceros, hyaena and lion—brandishing his first weapons or chipping his first tools. The visitant might gaze in wonder at the emergence of this new creature, endowed with a responsiveness of brain which, perhaps, his tool-using arts had helped to bring about; but he would gaze with still greater wonder when the curtain rose again, and showed him the world as it exists to-day, with a mass of accumulated knowledge transmitted from generation to generation, and with literatures "preserving as in a vial the purest efficiency and extraction," the thoughts and feelings, dreams and disappointments, of "the living intellects that bred them." He would say: "This step is a great one indeed; and the chief purpose in the education of these beings surely will be to introduce their young to the last and greatest heritage of their race. Nature is important; tools are important; but books are important too."

The teacher, answering the unaccustomed visitant, would say: "We *do* introduce our pupils to books. One weary year after another we have been teaching 'reading,' and if you will test yonder class of boys, you will find they can read quite fluently." So, indeed, it turns out. And yet, some strange things are discovered by the Venusite or Martian, who, I may remark, is omniscient. He questions the class (a Standard VI.), and finds that they have little or no knowledge of English authors at first hand; no knowledge at all of prosody (whether a Shakespearean line contains ten or twenty syllables they have never been expected to inquire); and no knowledge at all of the simplest literary criticism (if asked to select the verse of a poem which they think finest, they will feel surprised and helpless).

School Practice.

"Oh, you would like to hear the recitation?" The visitant hears it, some lines from *The Merchant of Venice* in the first class, *Casabianca* in the sixth class. Every child

knows the lines well, and when asked the "meanings" of "ducat," "heroic," and other "hard words," gives correct answers. The teacher rubs his hands, and congratulates himself rightly upon the success of his year's hard work.

Presently, the class is at "grammar." Some sentences are analysed, and certain words are parsed. "For thy three thousand ducats here is six," is the first luckless piece. Somehow, the verb does not "agree with its subject in number," though its "person" is beyond reproach. And presently, when "the very tyranny and rage of his" has to be parsed, the pupils discover, with renewed embarrassment, that a preposition can *apparently* "govern a pronoun in the possessive case"—contrary to all precedent! Except for these two difficuties, the class-work proceeds with unruffled calm.

The enlightened visitant feels that there is something remote about the whole method. He has never been told, in Venus or Mars, that grammar "trains the mind," and if he were informed that it does, he would ask for the evidence, and find little.

Teachers are not to be blamed for this parlous condition of English in our Primary Schools, where, indeed, an important and salutary change has already begun. The entire series of concepts dominating the teaching of the subject has been wrong. Let us see what some of these concepts were.

Grammar as an "Art."

Vaguely, it was recognised that children should be taught to speak correctly. Most children did *not* speak correctly, owing to bad example at home or in the streets; the school had to seek to correct this. But the school set about its task in the wrong way. It taught the "rules of grammar," grammar being then defined as "the art of speaking the English language with propriety." Here was a double, or a triple, blunder. The school should have attempted to eradicate the *habit* of bad speaking: should have insisted upon children always

answering oral questions in good form; in short, should have "taught composition" in every lesson of the day. But *written* "composition" began only in Standard V., and oral composition was not taught anywhere!

Nevertheless, "grammar" was taught even to the lowest standards, and when critics urged that it had no appreciable effect upon speech,* the notion of grammar as an art was dropped. Grammar was a science, not an art; it was the "science of language." But here again the position was absurd. No "science" is possible unless there is a mass of material to be reduced to scientific form. A "science of language" implies the existence of a mass of words and usages. But the child in Standards I., II., or III. was only gradually learning the meaning of words and usages; thus all "science" was impossible. As well talk about the laws of electricity to pupils who had never known electrical phenomena, as well teach geography to children who had never seen a hill or river, as discuss grammatical definitions with children who themselves were learning the elements of speech—and learning them with labour and difficulty. When to this is added the fact that the rules and definitions of grammar were mostly false or misleading,—"An abstract noun is something (or the name of something) we cannot see"; "The subject of a sentence is the doer of an action"; "A verb shows action," and so forth—false, or misleading, partly because true rules and definitions would be too subtle and qualified for children's understandings, partly because grammar books were what they were—when this fact is recognised, the folly and impossibility of the whole procedure is obvious.

Grammar as a "Science."

No doubt, reading was taught, and no doubt, owing to the influence of Matthew Arnold and others, "recitation" was introduced. But English as an art of speaking, and English

* Some American researches have shown recently and statistically that there is no relation between knowledge of "grammar" and power to compose English. The fact has long been obvious.

literature as one form of an æsthetic revelation of the universe—these things were not taught at all. We are just beginning to teach them. It is to the second of these that I now particularly turn, leaving the technique of "reading" alone for a season.

I shall assume that our boys have mastered the simpler mechanical difficulties of reading. We are now going to teach them to enjoy literature—not simply to *read*, not simply to *recite*, but to enjoy. How are we to do it?

I have thought it best to take Shakespeare's *Merchant of Venice* for special consideration; but a few general remarks may well precede that theme.

II.

READING BOOKS.

The selection of literature means, in practice, the selection of reading books.

In these a great change has taken place of recent years. Many of them are now quite excellent, alike in print and in illustrations. Whether they are equally good in the matter provided is less certain, but, on the whole, one can say that sound principles are increasingly recognised by the compilers of these books.

Lower Standards.

The lower standards should be regaled on ample and very miscellaneous material. The mythical and legendary element may be prominent in the form of stories of Greece and Rome, of Kelt and Norseman, of King Midas and King Arthur. Animal stories, or even the old-fashioned "natural history," have considerable attractions. If "information" (geographical, scientific, and the like) is attempted in "reading" books, it should take an interesting, vivid, and romantic form; "diagrams" and outlines are utterly out of place; the time for them is not yet.

Simple stories, dealing with domestic and other virtues, may also be included.

Upper Standards.

The upper standards may read vivid selections from great historians, biographies of great thinkers, scientists, adventurers (generals and admirals, too, but to a less degree than in the past), accounts of great inventions, not in dry detail, but in rich, romantic, or at least suggestive guise, and accounts of great travellers and discoverers.

A story like that of Joan of Arc, as commonly presented in the all too brief history lesson, loses nine-tenths of its interest because of its very inadequacy; it is a mere outline. In the "readers," on the other hand, the story may stand out in all its wonderful richness as a revelation of the thought, superstition, and barbarism of the Middle Ages. So, too, with the story of Columbus, usually so inadequately treated. The reading book should be full of such matters as these, so that the teacher may at any moment turn aside from his history lesson to refer to the glowing episode described by Prescott, or Motley, or Macaulay; or from his geography or science lesson to refer to some biography similarly set forth in the reading book. In fact, all subjects should receive illustration and support from the "readers," though I should not suggest any over-precise "correlation."

It has sometimes been said that all readers should be "continuous." The disadvantages of "scraps" are obvious in the light of the "apperception doctrine" (Vol. I., p. 108). But, on the whole, the school cannot afford to do without books of selections, though one book of a continuous kind should certainly be included in every year's reading. It is the business of the teacher to reduce the "scrappiness" of the "scraps." He must show their significance, their place in the book from which they are derived, and their authorship. He must fit into his scheme every "scrap" that can be so treated.

I suggest that there should be, even in the highest classes, a certain amount of very *easy*, but not childishly simple, reading. The most capable and enthusiastic teachers are the most inclined to select rather hard literature. Their lessons may be successful, but the tension will be high, and I think it advisable that occasionally the class should be set to read books requiring hardly any effort, for we do not wish the reading lesson to be always associated in a boy's mind with ideas of labour. A number of the *Books for the Bairns* are quite possible for an upper class.

There are certain advantages in having a poetry book distinct from the prose readers. I am inclined to suggest that most poems* should first be read to the class by the teacher—provided the teacher can read them *well*, with proper effects of suspense, climax, emphasis, etc.—as it is of the very highest importance that a vivid impression be made by a poem from the first, and this is almost impossible if the class has to struggle with the difficulties of reading. Thus there is a certain justification in establishing a different atmosphere and tradition for the "poetry" and the "prose,' and consequently for using distinct books.

III.

ELUCIDATION OF MEANING, AND "TEACHING TO THINK" IN A LITERATURE LESSON.

Instead of giving a list of more or less vague maxims for the guidance of the teacher, I propose at this point to consider the treatment of a play like *The Merchant of Venice* in an upper class.

Now, English Primary Schools do not teach mediæval history, and any proposal that they should do so would be received with indignation; "*English* history is bad enough," teachers would say. But here is *The Merchant of Venice*.

* Also pieces of prose that are exceptional in difficulty or grandeur.

Are we going to do justice to it or not? Is Venice going to be made a real place for our children? Every good teacher must answer, "Yes." We must teach something about the history of Venice.

Venice.

The teacher must therefore begin with a lesson on that subject. It will be a *vivid* lesson, not a series of dry and detached facts, but an historical panorama and pageant, that will kindle the imagination of every child. Why should a lesson on Venice be dull? Geographically, there is the position and unique character of the city; historically, there is the record of her birth, her rise into importance, her wars against the Turks in the times of the Crusades, and after; her monopoly of the Eastern trade in spices—commodities much in demand during the Middle Ages, owing to the monotonous character of European diet; lastly, her decline when the Cape route became known, and the history of Portugal reached its glorious climax. A few illustrative paragraphs from literary works may be read to the class—the opening lines of Ruskin's *Stones of Venice*, the description of the fourth crusade in Mrs. Oliphant's *Makers of Venice*. The names of the great painters who have been identified with Venice might be given, Titian, Tintoretto, Turner, and prints of their works be shown. Then, too, there are Shelley's and Rogers's lines.

Especially should the teacher deal *in advance* with such matters as will come up in the course of the play, not mentioning necessarily that they *will* come up, but ensuring that, when they do come up, they will be understood. For example, the Venetian trade in spices is mentioned in the first scene; the long Venetian conflicts with the Turks give point to the Duke's reference in the "trial scene" ("stubborn Turks and Tartars, never trained to offices of tender courtesy"), as well as to the political action in Shakespeare's greater drama of *Othello*. Again, the rivalry of Venice and Genoa would necessarily be referred to, and the name of the Genoese

admiral Andrea Doria would be *deliberately* introduced, not only on account of his historical importance, but because he is indirectly mentioned in the first scene ("my wealthy Andrew docked in sand"); there would also inevitably be a reference to the two discoverers of America, one a Genoese, the other hailing from Venice—Columbus and Cabot. Needless to say, a map of the world must hang in the room, and be referred to.

Would you cram the class with all these facts before introducing the play? Yes, with all *these* facts, because they bear on the understanding of what Venice was. They give the requisite "atmosphere." But I should not "cram" the class with disconnected and miscellaneous facts. For example, there is a reference to the "hour-glass" in the first scene; I should wait until that was met with in read ing the play before discussing it. Nor should I explain in advance such references as that to Nestor. On the other hand, I should deal, *at some length*, with the relation of the Jews to the Gentiles during the Middle Ages, with the papal and national prohibitions of interest (then called "usury"), and with the folly of these well-meant prohibitions, based on the old Aristotelian doctrine that money was barren, a doctrine echoed in Antonio's words:—

"When did friendship take
A breed of barren metal of his friend?"

Valuable lessons on inter-racial relations can be suggested, if not directly inculcated, by such a discussion as this, the class being led to realise the greatness, as well as the defects, of the Jewish nation. Shylock's famous protest ("Hath not a Jew eyes . . .") will then have some chance of being appreciated. If Jews are avaricious, the reason is not far to seek. Persecution, plus the usury laws which prohibited Christians from taking interest and thus threw the money market into the hands of Jews, explain it perfectly.

I think, too, something should be said about the Elizabethan period, when Shakespeare wrote this play. An outline "Life

of Shakespeare" is not of much value, but the rise and nature of Elizabethan drama may be briefly considered; and there should certainly be a reference to the puritan opposition. There are possibly anti-puritan references in *The Merchant of Venice*, both put into the mouth of Gratiano; for example, the passage beginning—

> "Why should a man, whose blood is warm within,
> Sit like his grandsire cut in alabaster,"

and the later passage, beginning—

> "If I do not put on a sober habit,
> Talk with respect, and swear but now and then."*

The more usual plan of teachers is to explain such things as they occur in the course of reading the play. I agree with this plan for all minor matters; but for an understanding of the broader issues of the play, I think a careful exposition along the lines just indicated is highly desirable. It will provide the class with "apperception material" that will add greatly to the interest of the play, for interest, as I have urged so frequently, often depends on apperception. Give a vivid picture of Venice, and of Venetian life and thought, more especially those aspects of it that will bear upon the play, so that, for example, the Rialto will be a reality to the children before they read about it. By following this advice, teachers will have the pleasure of calling up flash after flash of apperceptive interest,

"Meanings" and Questioning.

Commonly, there is far too much "questioning" over the meaning of words, and not enough questioning—or rather, "problem-setting"—over the general significance of entire works or passages. When a new or difficult word occurs, the teacher may very well ask for its meaning, and if this is spontaneously forthcoming from a pupil, accept it and pass on; but I distrust the all too common practice of worrying the class under the impression that everything must be

* I. i. and II. ii.

"drawn out" from them. "What is a saint?" asks the teacher. One child answers, "A good man!" "Y—es; but not exactly," says the teacher doubtfully, unwilling to reject, and unable to accept. "So-and-so was a 'good man,' but we should not call him a 'saint.' Does anyone else know what a 'saint' is?" More wild guessing follows, the false answers being perhaps as firmly fixed on the memories of the class as the correct answer, which itself has probably to be given by the teacher in the end, despite his valiant attempt to "draw it out."

Must the teacher never "draw out" things, then? Yes, he must draw out much, but he must take care that there is something valuable, not trivial, to be drawn out. If the boys know the meaning of "saint," there is no need to draw it out; if they do not, or if they only know it very vaguely, there is no possibility of "drawing it" out, except at great pains; if some know and some do not, and those who know answer correctly, the ignorant are as much being "told" the meaning as if the teacher himself "told" it. The truth is that, if a whole play, or several plays or works are to be covered intelligently, the teacher has not much time to spend on individual "meanings"; general grasp is the main thing. I would recommend that, wherever necessary, the teacher should lightly indicate the meaning of any unfamiliar word, sometimes by gesture, tone, or emphasis, sometimes by a synonym; and should reserve his greatest efforts at "drawing out" for other and higher tasks.

What tasks?

The "Problem" Method.

Let us assume that the teacher has read the whole of *The Merchant of Venice* to the class in instalments, with a few words of comment and explanation here and there. The class knows the story well, and has formed some provisional notions of the various characters. More systematic study is now to come. It must be partly "heuristic" in spirit—taking the form of

solving problems. Some of these problems may be guiding problems for the entire play, others incidental ones, suggested by individual scenes. "Who was the more brutal and unjust, Antonio or Shylock?" would be an example of the former. "Is there any 'answer' to Shylock's first speech in the court of justice?" would be an example of the latter. It is in this way that we can "draw out" thoughts from our pupils, only we must give them a clear notion of the general drift of the play (preferably through a vivid reading of it by the teacher), and we must then give them ample time to study it for themselves, from the standpoint of a series of problems.*

No doubt, there are many things that would fall outside any series of problems, however skilfully constructed, and allowance should be made for this. Pupils should be encouraged to invent new questions on their own account in the course of their reading; to make notes of things they do not understand; above all, to draw up a list of lines that they wish to learn by heart, for, as I shall show in a later section, "recitation" and "literature" are not to be regarded as distinct. But a few leading problems are most valuable as guides to study, and as means of "teaching to think." Obviously, the themes thus suggested are excellent for "composition" purposes.

After the play has been considered in these two ways—first read over impressively, and with a few comments by the teacher, and then made the object of intellectual study, largely silent, through the medium of problems, it may then be read through by teacher and class, scene by scene, so that the beauties of thought and diction may now become more apparent. "Parts" should, of course, be taken in order to obtain the dramatic effect. Passages, and, in some

* The questions, "Who was the better man, Brutus or Cassius?" and "Who was the cleverer man, Brutus or Cassius?" give definiteness to much of the study of *Julius Cæsar*. ["You say you are a better soldier," remarked Brutus. In point of fact, Cassius had proved himself an excellent soldier in the ill-fated campaign of Crassus.] "Do you think Shakespeare was a Catholic or a Protestant?" gives definiteness to the study of *Henry VIII.*

cases, single lines, may be learnt by heart. Last of all, some of the classical criticisms of the play may be read by, or to, the class.

It is my belief that *The Merchant of Venice* could in this way be covered in four months, at the rate of two lessons a week. A slighter treatment may be preferred by some teachers; or one play may be studied with some thoroughness and several others more briefly. In any case, the class should on no account be compelled in the first instance to struggle with the difficulties of reading aloud—the very best way to make the subject distasteful; the first impression should be vivid and pleasant, and this can only be ensured by the teacher reading to the class.

The laudable desire to "make children think"—to cultivate the "Fourth R" (Reasoning)—can perhaps be realised better in connection with literature than with any other subject. This statement is a reversal of common opinion, which regards literature as mainly cultivating the "faculty" of imagination. Still, I adhere to it; and the preceding paragraphs have, I hope, done something to justify it.

The statement, however, needs safeguarding. As already stated, the first impression of a good poem should certainly be æsthetic; the pupils should feel its charm and rhythm. Now there are some poems whose charm of rhythm constitutes their main characteristic; I am not sure that there is much need to deal analytically with such a poem as *The Lady of Shallot*; and certainly there has been far too much petty dissection of poems in years gone by. But other poems are fully worthy of rational analysis; and I would urge that, once the pupils have appreciated their metrical and verbal beauty, the teacher should throw out some arresting questions.

"*Arresting* questions." Not such questions as, "What does 'hero' mean?" There is a place for such questions as this, which resembles, indeed, the type of question that gave reputation to the Socratic method. But the questions of

Socrates were searching, disintegrating, disturbing; they "taught people to think."

Let me try to indicate further what I mean.

A class is reading Wordsworth's little poem, *The Tables Turned*, and arrives at the famous stanza:—

"One impulse from a vernal wood
Will teach you more of man,
Of moral evil and of good,
Than all the sages can."

The teacher may now ask a pupil to sum up that stanza in a sentence. Then comes the question, "Do you think Wordsworth was right?" The class—especially if a class of girls—will probably answer, "Yes" (for all poets are infallible) "Tell me once again what the stanza means." Paraphrase follows. "And you really think Wordsworth was right?" "Yes" (more doubtfully). "Well, *why* do you think he was right?" "If we go out into the woods, we can study Nature better than from books." "Quite true; but is Wordsworth talking about the study of *Nature?*

'One impulse from a vernal wood
Will teach you more of ——'

What?" "Of *Man.*" "Is Wordsworth right in saying that you can learn more about *man* from the woods than from books? How do we learn about the ancient Romans, or about the Chinese; from the woods or from books? How do we learn about Wordsworth himself?"

At last some pupil, or pupils, will venture explanations that will, at least, be plausible or ingenious; and the teacher may sum up the case in words of his own. Such a lesson has involved genuine *thought.* Composition may follow.

I am convinced that we greatly underestimate the intelligence of children. Give them a subject-matter *worth* thinking about, and they will think—often with surprising success. I once asked a class that had learnt Chaucer's lines on the

"poor parson," whether they thought that in Chaucer's time the majority of "parsons" were as good as the one described by the poet. A girl replied that they were probably not so good; otherwise Chaucer would not have taken the pains he did with his description. The answer was a thoughtful one. Time, perhaps several days or weeks, should sometimes be given for these problems.

A class of girls was once reading the last scene in *The Winter's Tale*, and had come to the place where Leontes thought that the supposed statue *moved*.* I asked the question, "Do you think Hermione really moved?" It was perhaps a *bizarre*, a ridiculous question; but it had the effect at least of putting the two "faculties" of imagination and reasoning to work, and it was a good deal less *bizarre* and ridiculous than most of our usual questions on grammar. We decided in the end that Hermione probably *did* move; she could not help it.

IV.

LITERATURE AND MORAL INSTRUCTION.

I HAVE already expressed my belief that, in the course of time, moral instruction will occupy a much more important place than at present in our school studies. What its exact form will be, however, is a difficult question, and many experiments will have to be made before an approximately satisfactory scheme can be evolved.

Meanwhile, I wish to emphasise what has been already expressed in another connection. Much can be done to instruct children in moral, social, and political matters by a sensible discussion of Shakespeare's characters and situations. No doubt to many of our educationists, trained on public school lines, there will be something amusing in this suggestion; far more valuable than discussions on serious

* "Would I were dead, but that, methinks already . . . ."

and living topics would be discussions—they tacitly urge—on "Greek accents or bowling averages"; but educationists who are obsessed by the fallacy of "formal training," are, for the most part, fundamentally wrong on the essential things of the educational world.

I believe that, in the course of time, every school teacher will be provided with a comprehensive syllabus of moral, social, and political doctrine, roughly graded according to the ages of the children, and extending far on into the adolescent period—a period which, in years to come, will be well provided for by a new type of "Continuation School." In the course of the teacher's ordinary lessons on literature, history, or other subjects, he will constantly be coming across matters that serve to illustrate (or amplify) this syllabus.

For example, in many parts of London, betting on horses is the favourite excitement of the poor, and when a man has lost on one horse he endeavours, with the assistance of expert "racing prophets," to retrieve his fortunes by betting on another. In dealing with Bassanio's "childhood proof" in the first scene of *The Merchant of Venice*, the teacher might very probably refer to the folly of such a thing as this. He should certainly discuss whether Bassanio's attitude towards his friend was a noble one, and should point out that recklessness is not only fatal to the person who is guilty of it, but involves others in his trouble. We cannot always "do what we will with our own," especially when our "own" is *not* our "own."

There are excellent "temperance" themes in *As You Like It* and *Othello*. Old Adam's confession:—

> "In my youth I never did apply
> Hot and rebellious liquors in my blood . . .
> Wherefore my age is as a lusty winter,
> Frosty but kindly,"

is an antedated commentary on the statistics of insurance companies; while Cassio's fiery outburst against the foe that

had undone him is as sound as the warmest teetotaller could desire :—

"Oh that a man should put an enemy into his mouth to steal away his brains! . . . Oh thou accursed spirit of wine! If thou hast no name by which we may know thee let us call thee Devil!"

I assert that passages like this should be learnt by heart by every English boy, not necessarily as a part of a teetotal propaganda, but as passages full of force, suggestion, and humanity. And I assert that moral instruction of this kind, taking the form of hints springing spontaneously out of the subject matter of the various lessons, is of the greatest value. Its very spontaneity, its absence of professionalism, is likely to render it peculiarly effective. Hints dropped in the way here suggested are generally remembered for life.

V.

"EXPRESSIVENESS."

THE demand for "self-expression" has been raised by the Fröbelians, more especially in connection with their suggested "occupations." After a child has seen and handled an object, and understood something of its function, he expresses his idea of it by drawing or by clay-modelling; mechanical or social processes—for example, the work of cobbler or postman—he expresses by gesture, accompanied, perhaps, by words or song.

Expression and Impression.

Now, it is important to notice that such *expression* presupposes *impression*. A child who had never seen a certain object or process could not *express* it by drawing or gesture, a fact which some infant teachers forget. Children have before now been set to model an anchor in clay, though they had never seen an anchor, nor even a suggestive picture of one, only a bare outline picture drawn by the teacher! In other classes

they have been made to beat one fist on another to imitate the cobbler's work; they had never seen a cobbler, nor had the teacher even used a boot or shoe to illustrate the process! There is, perhaps, no harm in this, but it is not "self-expression," it is not Fröbelianism. Unless a child has an idea, he cannot "express" it. You cannot "draw out" what is not in the child.

The Place of Imitation.

Expressiveness in reading, recitation, and elocution follows the law above described. Unless a child understands to a certain extent the words it is uttering, it cannot utter them "expressively." The child cannot, at any rate, utter them *self*-expressively. It can imitate the tones of the teacher's voice, and I do not say such imitation is useless; in the same way the five year old child can draw the teacher's blackboard anchor and thump its own fist in the cobbler game. But clearly, though the immediate imitation of the teacher may have a certain important part to play, it should not represent the school ideal. The child's words must come from its own mind and heart, if they are to be true and meaningful words; anything short of this has an element of unreality and falsehood. Perhaps the best way to sum up the facts is to say that, though the process is *ultimately* imitative (for language is based on imitation), it should not, as a rule, be *immediately* imitative, except in the lowest classes of the infant school. Or, perhaps a still better statement is that impression and expression help each other. So I would urge that in all standards, though more particularly the lower, action and gesture should be extensively and intelligently used. The "muscle memory" is powerful. A poem like *The Inchcape Rock* can be rendered dramatically with great success; expression does, to a large extent, react upon "impression," as the James-Lange theory of emotion asserts.

Take the opening lines of *The Merchant of Venice*. It is a minor matter whether the teacher should first read the

whole scene aloud, and then begin a brief discussion of the first few lines, or whether the discussion should come first; but one method would certainly be wrong—for the teacher to read the seven lines of Antonio's speech, and then call upon the class to echo those seven lines. Still worse would it be to take the piece line by line, teacher—children, teacher—children. On the whole, I think the best plan will be based on the one already discussed. The teacher has read *the whole through, after careful preparation of his own* (in which he has made up his mind what words to emphasise, what lines to "run on," and so forth—it is no good to trust to the "spur of the moment" in such matters), and, of course, after giving his class some idea of the story that is to be studied. Then will follow the "problem method" already discussed. Now will come the detailed elucidation and reading of the first scene. Let us take Antonio's speech :—

> "In sooth, I know not why I am so sad :
> It wearies me, you say it wearies you;
> But how I caught it, found it, or came by it,
> What stuff 'tis made of, whereof it is born,
> I am to learn;
> And such a want-wit sadness makes of me,
> That I have much ado to know myself."

Let me repeat my word of warning. *Do not, as a rule, spend much time on the meaning of individual words, like "sooth."* Pass it over rapidly, "in sooth—in truth," and get on to the poetry itself; make sure of the general drift being grasped. The asking of isolated "meanings" is far too common, alike in reading and in recitation lessons. Words derive much of their meaning from their context.

With this warning in our minds, we proceed with the opening lines of the scene. It was, we suppose, read over powerfully by the teacher some weeks before, with marked differences of tone to indicate the differences of

temperament of the various speakers—the melancholy of Antonio, which has now become chronic; the boisterous and caustic cheerfulness of Gratiano, and so forth. He now calls on a boy to read the first seven lines. The boy does so in a somewhat mechanical fashion, with no long pause after "learn," and, perhaps, clumsily linking "want-wit" with "sadness." The teacher points out that a weary, melancholy man is speaking; do such men speak in a continuous, clock-like fashion? No; they break their discourse, sometimes with sighs. A normal individual would utter all the words of Antonio's first line, after "sooth," as a continuous sentence; but Antonio would probably break it at "not," with a pause and a falling inflection the "know" being emphasised.* So also, after "me" in the second line. The common mechanical rule that a comma represents a rising inflection ("keep up your voice at a comma") is utterly inapplicable here. "It wearies me." The words must come out "wearily," and, perhaps, accompanied by a gesture of some kind. The second "you" must, of course, be emphasised.

Inflection and Emphasis.

Can this be "drawn out" from the children? Not all of it, perhaps; but by encouraging the class to volunteer readings, and by commenting upon these, I think most teachers would be able to build up a tolerably expresive rendering of the passage. No doubt, echoes of the teacher's first reading would operate, and why not? Self-expression, as I have pointed out, is preceded by "impression." The only thing to guard against is constant mechanical imitation, not thoughtful imitation.

Then the sixth and seventh lines, with their unusual word "want-wit." Here is a fine chance for "teaching boys to think." "Who can read those lines sensibly?" the teacher asks. At last a boy succeeds; and the teacher drives home

* Or possibly "why" should be the emphatic word, and the first half of the line (up to "not") be uttered with rising inflection, and the last half with falling.

the lesson that "want-wit" is emphatic, and is the grammatical "object" of the word "makes" ("Sadness makes of me such a want-wit that . . ."). How is emphasis shown? By a pause before or after the word, and by change of inflection. How shall we show it in this case? Certainly by a pause *after* "want-wit." Why has not the printer placed a stop there, then? And shall we raise or lower our voice on this word? It scarcely matters; though, perhaps, as a sad man is speaking, the falling inflection is preferable.

The teacher may now very well read over the whole seven lines before passing on to the speech of Salarino. There is no great objection to the boys making marks on their copies, if their own, to indicate emphasis, pause, rising inflection or falling inflection, but I am inclined to think this is undesirable, except in difficult passages.

The first line of the next speech contains the word "ocean," clearly a trisyllable in Shakespeare's time. This introduces a difficulty. Are we to sacrifice the metre for the modern pronunciation, thus reducing the number of syllables in the line to nine? We must; but the teacher should certainly *indicate* the original reading, and discuss the structure of the normal iambic pentameter. In the present case, the irregularity is by no means objectionable; the idea of "tossing" wedding itself well with an uncouth line:—

> "Your mind is tossing on the ocean;
> There, where your argosies with portly sail,—
> Like signiors and rich burghers of the flood,
> Or, as it were, the pageants of the sea,—
> Do overpeer the petty traffickers,
> That curtsey to them, do them reverence,
> As they fly by them with their woven wings."

On the other hand, where mere accent, not pronunciation, is concerned, as with "obdúrate," "miscónstrued," and the like, the Shakespearean usage must be followed.

Salanio's speech follows :—

"Believe me, sir, had I such venture forth,
The better part of my affections would
Be with my hopes abroad. I should be still
Plucking the grass, to know where sits the wind;
Peering in maps for ports, and piers, and roads;
And every object that might make me fear
Misfortune to my ventures, out of doubt,
Would make me sad."

Here the chief points are the necessity for a short stop after "hopes," and for linking "out of doubt" rather with the words that follow than with those that precede. Both points, I think, can be elicited from the cleverer children; but if difficulty is experienced—well, the teacher must explain and illustrate. There is no serious objection to imitation, if, as I have already urged, it is intelligent imitation. The Shakespearean meaning of "still" (=ever) must also be referred to.

Lines 35 and 36 are unintelligible without a gesture. Why should gestures be banned from the senior school while elaborately cultivated in the "action songs" of the infant school?

Is there to be no study of "grammar" at all? A little, certainly. For example, in a later speech of Salarino (lines 47-56) there are several instances of the now dying subjunctive mood; an intelligent teacher would, perhaps, ask why "swear" is not "swears" in the line:—

"Though Nestor swear the jest be laughable."

Incidental Grammar.

Talking of grammar, I would urge that wherever the construction of a sentence can be rendered clearer by "analysis," the latter should be attempted, as, for example, in the sixth line, already mentioned ("Such a want-wit sadness makes of me."). But the "analysis" (and "parsing," likewise)

should be kept close to the living thought of the play, it should elucidate the latter, and not be regarded in the abstract merely as means of "training the mind." I should rarely think of analysing a sentence, except for the purpose of making the author's meaning clear. If this rule had been followed for years past, our pupils would never have been thrown into a state of sceptical wonder as to why *sentences* need to be "analysed," while bricks and fire-escapes do not.

Memorising.

At this point I might, perhaps, suggest to my pupils the desirability of some of them learning by heart such lines as the half-humorous contrast drawn by Salarino between the merry and the solemn man:—

> "Nature hath framed strange fellows in her time:
> Some that will ever more peep through their eyes,
> And laugh, like parrots at a bag-piper;
> And other (s) of such vinegar aspéct
> That they'll not show their teeth in way of smile,
> Though Nestor swear the jest be laughable."

I should point out to my class that such lines readily lend themselves to quotation, and that an essay can be rendered very telling when its writer is thus familiar with illustrative passages from great authors. There are several other passages well worth memorising in the lines that follow; for example, Gratiano's denunciation of over-anxiety:—

> "You look not well, Signior Antonio;
> You have too much respect upon the world:
> They lose it that do buy it with much care."

Members of the class may even be encouraged to enter all such passages in a special book, only there should be an element of the voluntary in all this; the slower members of the class need not be expected to memorise or to keep a record of so many passages as the quicker members; perhaps, indeed, of none at all in special cases.

VI.

PROSODY AND STYLE.

Testimony from people interested in "Limerick" competitions goes to show that not one Englishman or Englishwoman out of a hundred has any definite ear for metre. They patiently learnt their one poem a year during their school careers, but the fact of a regular recurrence of accent in ordinary poetry has made so little impression upon them that they put forth as a "Limerick" a jumble of syllables completely devoid of regularity, and even of rhyme.

Partly, this is due to a pernicious notion—referred to in another section—that metre must be practically ignored in *recitation.*

But there is another and weightier reason for people's ignorance of metre. We have never *taught* metre; and yet the subject is full of interest. It is a subject, too, where simple "heuristic" methods are specially available.

There is a possibility that prosody may some day become as formal and dry a department of literature teaching as grammar is at present. But that time is remote; and I do not in any case suggest that the teaching of very much prosody be undertaken. But after a teacher has read a poem to the class, he may very well ask for the scansion of the lines. The number of feet in the line, and the nature of each foot, can be discovered quite easily. Matters like the predominantly iambic style of English poetry; the frequent appearance of a trochee at the beginning of a line, even in iambic poetry; the light effect of trochaic poetry like *Hiawatha;* the verbose grandeur of anapestic poetry like *The Destruction of Sennacherib,* and much of Swinburne; the peculiar foreign effect of classical hexameters, as employed in *Evangeline* and *The Courtship of Miles Standish*—such matters would come up and be briefly discussed.

If the critic objects that there is no time for this, the

answer is that so long as time is wasted, even in upper standards, on purely mechanical lessons in writing and dictation, time should be made for a few stimulating hints on the interesting problems of prosody. Besides, I cannot too often remind the reader that all the pupils of the class need not be expected to answer questions on this subject with minute correctness. Literature is not a subject for "thoroughness," but it is certainly a subject for intelligence and stimulus.

Style in prose and poetry is another, though closely allied, subject that demands attention. Provided with a book of miscellaneous selections from standard authors, the class may well be asked to discover the chief stylistic differences between one writer and another; or, in cases where the discovery is too hard a task, the differences may be frankly pointed out by the teacher. Not much time can be spent on this—perhaps none in a difficult school; but, if nothing more can be done, a few hints can at least be dropped.

A good plan, after the teacher has read a piece of poetry to the class, is to ask whether they like it. In most cases the reply will be that they do, for they know that, as a rule, they are *expected* to like it. The teacher may then collect a few reasons for the likes (or dislikes), and frankly throw out critical hints. It is important that pupils should recognise that all poetry is not on the same level.

That differences of style and power are quite noticeable by intelligent children I know, from a test of my own. After briefly pointing out the contrast between the verbose Fletcherian and the rapid Shakespearean portions of *Henry VIII.*, I read a few lines from a portion of the play which had not previously been referred to, namely, Buckingham's speech in Act II. That this speech was probably the work of Fletcher was noticed at once by some of the boys.

I see no reason, also, why the marked differences between Shakespeare's earlier and later styles should not be noted. The highly regular iambic line of his first plays gave place

to a much less regular line, in which, however, the genuine metre is quite noticeable, and which thus differs essentially from the slipshod and prosy lines occasionally found in the Fletcherian portion of *King Henry VIII.*, *e.g.*:—

"Install'd Lord Archbishop of Canterbury."

"This is the state of man: To-day he puts forth."

A little encouragement may well be given to the composition of simple verses, but this should be mainly a home exercise of a voluntary nature. Child-study statistics go to prove that before or at adolescence there exists a strong impulse towards poetical composition, and the gratification of this, under reasonable conditions, would do much to make children realise the structure of a poem and the greatness of our great poets.

VII.

RECITATION.*

THE great mistake of the past has been to regard "recitation" as a separate subject, essentially distinct from reading, or literature, or history. We have treated our various "faculties" in isolation; and "recitation," along with dates and tables, has been supposed to cultivate the "memory faculty." Recitation must, however, be justified on quite other grounds. Whether we prefer the Fröbelian category of "self-expression" (linking this on to "impression"), or whether we prefer the Herbartian category of "interest," matters little. Both categories are more helpful than those of the "faculty psychology."

Whenever, in the course of our various lessons, especially our reading and literature lessons, we come across passages, or even single lines and phrases, whose intrinsic merits are obvious, children should be encouraged to learn them "by heart." All the class need not learn every passage, and there

* For American readers I would point out that this word is used in the narrow English sense—memory work in poetry and prose, not in the wide American sense of "lesson."

should be no insistence on word-perfect accuracy, except in passages of the highest importance. It is a great thing to make such passages *familiar*, even if not a single child can repeat them *verbatim*. There should be, I repeat, a free and easy encouragement of every child to learn at home, or at odd times, whatever he feels he would like to learn, though the teacher should not hesitate to express, in considerate language, his own judgment upon the selections. It is important that differences of critical opinion should be admitted, and even encouraged.

By this general and generous encouragement of learning poetry, quite a large amount may be "learnt by heart" without painful effort and without tedium. Once every fortnight, or thereabouts, half an hour, or longer, may be devoted to hearing various members of the class recite their chosen pieces. The teacher will make a few comments upon the author, the piece, and its delivery, and may, in special cases, encourage others to learn the same.

Or, possibly, five or ten minutes may be assigned every day to this kind of work. If a child does not quite know his piece, he may be allowed to *read* it, in whole or part. One cannot too often emphasise the fact that the purpose of "recitation" is not to improve any "faculty of memory"—most psychologists agree that this "faculty" cannot, in the usual sense, be "improved" at all—but the providing of the mind with wholesome thoughts, clothed in noble words. Quantity is far more important than—I will not say "quality," but—word-perfect exactness. In Herbartian language, I would say that our business is to store the child's mind richly with apperception material of a more or less floating and available kind. Nor is a perfect comprehension of the dictionary meaning of every word necessary, though the teacher should be on guard against the extraordinary misinterpretations to which children often subject poetry. "The dark, unfathomed caves of ocean bear" has been interpreted by children with

"bear" as the name of an animal; and the teacher should always be nervously conscious of the inverted, or archaic, language of poetry.

But, in addition to this free and easy encouragement of recitation, the teacher's business is to teach certain pieces with considerable thoroughness. Yet I hesitate even here to lay much stress on "thoroughness." There is the ever present danger that a piece may be gone over time after time until the meaning of it has been lost, and the whole procedure reduced to dull routine. Far better that two score pieces be appreciatively, though very imperfectly, learnt by all the class—imperfectly learnt so far as the actual sequence of words is concerned—than that two or three pieces be known so "thoroughly" as to have lost any emotional appeal. Too great familiarity breeds contempt; apperceptive interest requires an element of *novelty*, as well as an element of the opposite.

Danger of "Thoroughness."

There is another reason for the warning I have just given. "Child study" is a science in so imperfect a condition that none of us can be very certain whether our choice of poems for children is satisfactory. There are educationists who believe that Shakespeare's plays are not suitable for school purposes; that though a skilful teacher can no doubt create a certain interest in parts of them, his interest is a rather anæmic and artificial thing; in other words, that the full Shakespearean appeal is to human beings who are considerably older than even the oldest of our school children. I do not share this view. But certain it is that we may often be utterly mistaken as to the suitability of our selected pieces. What is fine and inspiring to us—what has been regarded for centuries as fine and inspiring by all cultured men—may be unmeaning, or, at any rate, thin and dull, to the young child. Gray's *Elegy* is a possible case in point, though I am not sure that it is.

For this reason, therefore, we must beware of too great

"thoroughness." Do not exhaust a poem; to do this may be to disgust the child with it for ever, so that when, some day, he has so far grown in experience as to be able to appreciate it at its true worth, he will remember it only as the poem which, for a weary twelvemonths, was repeated by him and his classmates every Thursday morning.

Principles of Selection.

There are several principles of selection which, after considerable observation of the "recitation" lesson common to our Primary Schools, I would especially emphasise. These principles (which occasionally clash) should always be applied with caution; indeed, there are circumstances which may justify the abrogation of each of them. For example, a school which specialises in nature study, a school situated close to many interesting historical buildings, or a school with distinctive pursuits or needs, may rightly use certain poems which, in other schools, would be only moderately suitable. But the doctrine of "apperceptive interest" covers all such cases.

The first principle is that the metrical and rhyming element should be prominent in the poetry selected. Blank verse and rugged metres should not be extensively employed, though there is no doubt a legitimate, though limited, place for them in the higher classes. Children, like the primitive men whose representatives they are supposed to be, appreciate rhythm and rhyme, and these in obvious forms. The Fröbelians have employed this fact in the dances and "actions" of their songs. Elusive kinds of poetry, on the other hand, presuppose careful cultivation of taste. Similar principles apply to music and painting; for example, we do not expect children to appreciate elaborate musical compositions rich in dissonances; we expect them to appreciate simple and recurrent themes. Walt Whitman is scarcely a suitable poet for the Primary School.

Another principle of the greatest importance is that of correlation. That this may be "overdone" I do not doubt;

but, generally speaking, the principle is at present more honoured in the breach than the observance. In other words, the piece, or pieces, chosen for "recitation" may have little or no bearing on the subjects taught in the school.

Examples of this have been given in Book I.; Shakespeare's *Henry V.* is learnt along with the Tudor period, *Henry VIII.* along with the Plantagenet or Georgian periods, and so on! Now there may, in certain cases, be very good reasons for this dislocation: no one wishes slavishly to subordinate an important subject like literature to another subject like history; each subject has its own rights and claims. But once we have taken account of these rights and claims, we should also take account, *as far as possible*, of the principle of correlation. If we can fit our literature into our history, we benefit both subjects by enormously increasing the possibilities of apperception, and therefore of interest.

Correlation.

If a fine ballad has come down to us, let us use it to illuminate our historical treatment of the episode with which it deals. If we are dealing in our history lesson with Sir Thomas More, how excellent if we can refer to Wolsey's panegyric in *Henry VIII.!* If we are discussing the naval conflicts of 1788 and 1801, how much more vivid they become when the contemporary poems of Campbell are read in connection. When we arrive at the Peace of Amiens, how deep will be the historical impression if we read Wordsworth's sonnets composed on Calais shore! Needless to say, geography, too, has its correlation claims, though these are less urgent than those of history. Moore's *Canadian Boat Song* links itself to a lesson on the River Ottawa.

Certainly in these days, when the virtue of "patriotism" is being so emphasised, we should select—*other things being equal*—poems based on English rather than foreign themes. No doubt there are sometimes excellent reasons for departing from every rule we may lay down. We may wish to illustrate the characteristic virtues or modes of thought of other nations

and ages than our own; or some poem may be so unique in form or substance that, despite remoteness of theme, we may feel obliged to make it our choice. Such, however, are not the usual reasons why there exists such an astounding tendency to illustrate other nations' life and history rather than our own. The reason is—once again be it stated—that we have usually been thinking of the cultivation of a "memory faculty," and clearly a poem like *Barbara Frietchie* will serve that purpose as well as any other. But once drop that false ideal of education—once recognise the principle of apperception—and we shall think twice before including *Barbara Frietchie* in our répertoire. Finally, however, we may include it, though on other grounds than those we adopted at first.

Occasionally this principle of correlation may conflict with others. For example, a piece may be excellent for correlation purposes, and yet its metre may be unattractive. In such cases the poem may be impressively read by the teacher or pupils, briefly discussed, and then left. Again, the ethical sentiment may be too crude or too advanced for the pupils. Yet again, the teacher may ambitiously wish his class to know *one* poem at least of all the chief poets, and may therefore teach certain poems which set "correlation" at defiance. Probably Ben Jonson can only be made known to the Primary School child through one poem, "*Drink to me only with thine eyes.*" This, in itself, is a reason why, other things being equal, that poem should be taught.

I think it is a great mistake to exclude a poem because it is "hackneyed." The very best poems are being excluded from the school for this alleged reason. Teachers fear that inspectors and visitors will regard them as old fogies unless they discover fresh poems every year. Yet I am not surprised at the fear. One is reminded of the complaint of certain inspectors years ago that at Training Colleges the same songs were everywhere used, with the result that the said inspectors were "bored." This was a radically vicious complaint. If the songs were the best for the students, the boredom inflicted

on the visitors had nothing to do with the question. So also, if a certain two dozen poems are indubitably the best for school recitation, there is every reason why they should be taught year after year, and century after century. I would only urge that, in addition to this two dozen, there should be many other poems touched upon lightly in the course of school work.

I dissent, therefore, from the exclusion of really excellent, though "hackneyed," poems like the *Wreck of the Hesperus*.

An important principle of selection is based on the variety of English poetical forms. The trochaic metre of *Hiawatha*, the hexameters of *Evangeline*, the anapests of *The Destruction of Sennacherib*, represent unusual but striking metrical types, standing in contrast to the more usual iambic measures of English poetry. Again, there are the Spenserian stanzas, as in *The Faerie Queen*, *The Cottar's Saturday Night*, and in much of Shelley and Byron; there are the tetrameters of *The Lady of the Lake*; there is the sonnet form; there is the ode form, shown at its best in Gray and Keats; and so forth. I think that one principle of selection should be to introduce to the children as many of these important verse forms as possible, though I admit that the principle must sometimes conflict with others.

Moral Value.

Another principle is the ethical one. I do not mean that the ethical, or didactic, importance of poetry will entirely overshadow the literary and æsthetic, but that it will be always considered. We shall "teach patriotism"; we shall also teach, through poems of varying merit—from the *Surrender of Calais* to *Barbara Frietchie* and *Hervé Reil*—that patriotism is not an exclusively English virtue; perhaps, through poems and songs like those of Thomas Moore (*The Harp That Once*, etc.), we may bring home to our pupils that there is one luckless portion of the British Empire whose songs are as those of the Jews by the waters of Babylon; perhaps, through poems like

Barclay of Ury, we shall teach that there are types of patriotic courage even higher than those identified with war. Indeed, various phases of life and thought, such as those represented in *God Save the People*, *The Cry of the Children*, and countless others, will be dealt with. An attempt of this kind is represented in anthologies like *The Call of the Homeland* (Blackie).

And now, after the teacher (assisted, perhaps, by the children) has selected certain pieces to be learnt—pieces rich in metre, if not in rhyme—he should take care *not to destroy the metre by his own teaching*. There is an extraordinary tradition that, in order to "prevent singing" (!), poetry must be rendered as prose. Sense (*i.e.*, the printer's commas and semicolons) must override metre. If there is no comma at the end of a line, the children must rush on wildly, without stop, to the next. Let me give an instance. One class recites as follows:—

Preserve the Metre.

"The shades of night were falling fast, |
As through an Alpine village | passed
A youth, | who bore mid snow and ice
A banner | with this strange device, |
Excelsior!"

Here, owing to the absence of a comma after "passed," the class ruins the metre entirely by a mad rush after uttering that word. All that is really necessary to link the second line with the third is a rising inflection of the voice. Similarly with the absence of a comma after "ice."

Again, take some of the lines alleged to have been found in Dickens's desk after his death:—

"And when they are gone | I sit dreaming
Of my childhood | too lovely to last; |
Of love that my heart will | remember
When it wakes to the pulse of the past; |

Ere the world and its wickedness | made me
A partner of sorrow and sin, |
When the glory of God was about me |
And the glory of gladness within."

The above punctuation gives a jerky and prosy effect, quite destructive of the metre.

There are worse distortions than this. One of the most obviously regular poems in the English language, *Hiawatha*—a poem whose trochaic metre is its greatest charm—has been frequently ruined by incorrect accentuation of the proper names. A most cursory glance at the poem shows what must necessarily be the correct accentuation of such words as Chíbiábos. Yet the following scansion has been adopted before now:—

"Two good friénds had Híawátha,
Síngled oút from áll the óthers,
. . . . . .
Móst belóved by Híawátha
Wás the géntle Chíbiabós (!!!)
. . . . . .
Yés, the bróok, the Sébowísha,
Paúsing, saíd, 'O Chíbiabós (!!!)
Teách my wáves to flów in músic,
Sóftly ás your wórds in sínging."

It is impossible to blame a teacher for this, inasmuch as lessons on pure literature are essentially new to our schools. The laws of "Grammar" we have taught (*ad nauseam*); the laws of metre we have not. But the blunder in lines 4 and 6 is a grave one, all the same. Similarly, it is a blunder to mangle lines like

"Remember March, the ides of March remember,"

by uttering "ides" as a dissyllable. It is necessary to remember that if a poet wanted to write prose there was nothing to prevent him.

Another principle is even more important than the preceding. Let me introduce it by an illustration a little remote from the subject itself. Suppose we wished to make a child admire a fine picture, should we, in preference, show him the entire picture, or should we divide it into eight sections, and study each in succession? The answer is obvious. To divide up a work of art is to destroy it. The same applies, generally speaking, to the poems we set for recitation. Apart from the legitimate teaching of illustrative "selections," division is dangerous. On no account, I think, ought a poem like *The Wreck of the Hesperus* to be learnt in bits—two stanzas every week or month; such a plan sickens children of the two stanzas, ruins the connection with those that follow, and destroys most of the æsthetic effect of the poem. In fact, such a plan could never have been thought of, if the doctrines of "self-expression" and "interest," to say nothing of the laws of memory, had been dominating our schools.

Wholes or Fragments?

I would say, then, that in the case of poems which are being completely learnt, the *whole* should generally be read or recited—by teacher or pupils—in each lesson; or rather (for the word "lesson" suggests a half hour or forty minutes' period), in each recitation interval. Such intervals should be brief but frequent. If there are five a week the poem will probably be known by the majority of the pupils within two or three months at the most.

As explained in a previous section, children should not as a rule be expected to struggle with the difficulties of reading a new poem. Such a plan necessarily involves the ruin, or the non-recognition, of its form and beauty. While laying down no hard-and-fast line as to procedure, I would emphasise the fact that the attractiveness and significance of a poem will largely depend upon its first, and to a less extent its second and third reading by the teacher to the class. I even doubt whether, on these first readings,

Ear before Eye.

the poem should be under the eyes of the pupils in printed form—a method almost certain to produce loss of feeling through distraction. "Ear before eye" is a good rule. But after the poem has been heard by the class several times, so that its total effect has been appreciated, printed copies may well be introduced. Without their use there is considerable danger of absurd mistakes arising with regard to individual words.

In addition to short complete poems, there will, of course, be selections from longer ones. I would go further, and suggest that we might very well teach "quotations," especially from Shakespeare, and encourage the senior children to use these in their "essays." Obvious objections may be made to this by purists and pedants, and I am not supposing that the full force of the divorced quotations would be apparent to children; but the plan would do much, nevertheless, to enrich life and speech. I was recently present at a performance of *Troilus and Cressida*, and I remember the rustle that arose when Ulysses gave utterance to the much misunderstood line:—

"One touch of nature makes the whole world kin."

It was a homely case of apperceptive interest; old memories and familiarities echoed pleasantly through the minds of some hundreds of people.

Dictionaries of quotations, birthday books, and the like are thus not to be despised, and many a poet, many a poem, many a Shakespearean play that can never be studied in detail, may be made known to our pupils through an apt quotation. Take the lines from the second part of *King Henry VI.*, a play rarely studied:—

"What stronger breastplate than a heart untainted?
Thrice is he armed that hath his quarrel just."

Take any one of Shakespeare's oft-repeated protests against calumny—a vice which, despite the ninth commandment,

is probably regarded more lightly than any other in the decalogue:—

> "No might nor greatness in mortality
> Can censure 'scape; back-wounding calumny
> The whitest virtue strikes. What king so strong
> Can tie the gall up in the slanderer's tongue?"
>
> —*Measure for Measure.*

Take Cowper's lines on kindness to animals ("I would not enter on my list of friends. . . ."), Milton's on the invincibility of virtue (in *Comus*), and a thousand more; these, though "scraps," are well worth knowing by heart. And the same applies to biblical phrases such as the forceful "Let not him that girdeth on his harness boast himself as he that putteth it off."

Prose Recitation.

A further thought. Why not a few *prose* selections; a few passages from an historic speech of Cromwell, Pitt, or Burke, or even of more recent statesmen? Boys and girls are frequently fond of declamation, and there is no reason why this fondness should not be employed, more especially in schools whose pupils remain till sixteen or after. Burke's words beginning "Society is indeed a contract" (though from a book, not a speech), and the younger Pitt's last challenge, "England has saved herself by her courage; she will save Europe by her example," are instances chosen almost at haphazard. A few great lines from Froude, Macaulay, or other prose writers (preferably, though not exclusively, historians) may also be learnt by heart by some, or most, of the pupils.

Yet I can see in some of these suggestions the possibilities of a new formalism. One remembers how a paper on general knowledge was, a few years ago, added to certain examinations. The purpose was good—to encourage general reading among teachers. Yet no sooner was the paper introduced than text-books began to be issued; "general knowledge" was reduced to a new "subject." Similarly, I can conceive of selections and

scraps in prose and verse being made the basis of an isolated and lifeless lesson, divorced from the tastes and knowledge of the teacher himself. I would urge again, therefore, that there is danger in scrappiness, and that unless the teacher is willing and able to place the scraps in a background of significance, they will lose some, or much—not all—of their value. And that is only another way of saying that the teacher must be well read, and that the "humanities" must be given at last a place of honour in the school.

VIII.

CONCLUDING NOTES ON LITERATURE.

THE section immediately preceding has dealt more with the "expressional" than the "impressional" aspect of literature teaching, and thus belongs more particularly to the later portion of this book. But in truth this subject of literature is almost equally expressional and impressional. To appreciate noble poetry or prose is not the same thing as to be able to recite poetry or declaim prose with effect, but the two processes should be closely connected in all school work.

Imperfect, and perhaps controversial in some minor respects, the preceding hints for teaching English literature may be, but they will at least serve to point out the possibilities of this "new" subject. Methods will differ considerably with differences of teacher, pupil, and subject matter.

I conclude with a few miscellaneous notes, some of which have been already anticipated or implied in what has been said, and some of which will be further amplified in chapters that follow.

Much private reading, generally taking the form of home-work (the only possible kind of home-work in many localities), should be encouraged. Lists of suitable books, *with a few*

interesting hints about their authorship and subject-matter, should be present in every classroom. In the upper classes these lists should extend considerably in advance of the immediate needs of the pupils, who should be told that such and such books may be extremely interesting to them *in a few years' time*. Some of this private reading should be definitely organised; that is to say, questions will be set (perhaps in advance) upon the subject matter, and at regular intervals the results of the pupils' reading will be discussed in a short lesson. But the best treatment on the whole will be by means of short readings and stimulating hints. Is there need to add that the encouragement of reading will soon reduce the laborious class work in spelling and composition almost to nothing?

One strangely neglected kind of poetry is that of hymns. No doubt hymns are sung from Sunday to Sunday, but a thousand interesting facts of authorship and origin are absolutely unknown to most of the singers. Yet many an historical event, many a biographical delineation, receives a heightened interest from some hymn associated with it. In the little volume of *Hymns That Have Helped* (Penny Poets) there is ample evidence of this. Similarly, the fact that a poem has been put to music is no reason for its neglect as a poem; rather the contrary. Why should *Ye Mariners of England* and the like be rarely or never used for recitation purposes?

I have already perhaps sufficiently hinted or emphasised the need that any poem which the teacher intends to be used for class study should be introduced in an interesting—an arresting—manner. Let me give an example.

In the height of the War with France a gentleman landed in Britain from the Continent, and was immediately arrested as a "traitor." Brought before a court he produced from his pocket a manuscript poem, which he handed to the magistrate. "Whatever you may be, you are not a traitor, Mr. Campbell," was the response from the bench. The poem was—*Ye Mariners of England.*

In other cases teachers may adopt the plan so well known to writers of serial stories; to tell a story up to an interesting point and then—read the poem dealing with it. Certainly we shall never induce a genuine interest in literature until we have cultivated the art of telling stories—sometimes the actual stories with which our poems are to deal, sometimes portions of these stories, sometimes stories that link on naturally and awaken interest, as in the above instance of *Ye Mariners of England*. Or in many cases the teacher should *read* the story—and throw aside, in doing so, his English reluctance to be dramatic and impressive.

Fairy Tales.

Among our stories—told or read—should certainly be the immortal fairy tales of Andersen and Grimm. Men have attributed the "sourness" (real or apparent) of the Boers to the absence of such fairy tales from their early education; and if, as Ziller and others have contended, the moral life must remain poor and cramped unless the wings of the imagination are given a chance, such tales have a deep significance. And some day, I doubt not, our children will know not only these fairy tales, but the old myths of Greece and Rome, and, perhaps, of distant India and Japan. They will see Philoctetes on his desolate island and follow Jason home with his golden fleece. And thus, when our children become men and women they will easily appreciate translations of Sophocles and Euripides, and learn that such questions as "Woman's rights" date back at least as far as the story of Jason and Medea.

(F. H. H.)

CHAPTER VI.

History.

FEW people are satisfied with the status of history in the Primary School. Visitors are often struck by the excellence of the teaching of such subjects as music, drawing, writing—often, too, arithmetic and reading—but the occasions when the teaching of history has seemed specially good are so few that they remain indelibly impressed on the memory of the visitor; they remain distinct, and do not fuse into a general impression of excellence. "Such-and-such a school is the one where there is that good history teacher." Conversely, ignorance on the part of a teacher is, perhaps, more obvious in this subject than in any other. A teacher who speaks of the "Romans" sending Augustine to England, or of Charles V being "Emperor of Germany," confesses himself at once as a reader of third-rate text-books; he may not be exactly wrong, but—he doesn't know history.

Low Status of History.

In the present chapter I shall discuss very frankly the causes of the low status of this important subject. Of detailed hints I shall be sparing. I feel that problems of "method," in the narrower sense, are not very important here. The great "problem" is that of spirit.

But why teach history at all? For one reason (already referred to), because we live, nominally, at least, under a Democracy. Now, an ignorant democracy is at the mercy of every charlatan who mounts a political platform or finances a halfpenny newspaper. Unless our modern democracies are tolerably enlightened—tolerably well instructed in history and citizen-

History and Citizenship.

ship—they will, sooner or later, fall; perhaps not ostensibly, but, none the less, really; and the spectacle will be seen of "Freedom, free to slay herself, and dying while they shout her name." Democracies will become oligarchies or plutocracies, even though the forms of Democracy may remain. That the Franchise Bill was passed in 1885, and history not made compulsory in schools till fifteen years later, is a fact, therefore, of very grave import. Men cannot, as a rule, judge safely as to the needs of the future until they know something of what has occurred in the past. The "fiscal" controversy is a possible case in point; the House of Lords controversy is another. Arnold of Rugby saw in Thucydides "a living picture of things present." To use Herbartian terminology, the study of history provides us with "apperception masses" relating to political, social, and religious affairs. Judgment in these matters depends on knowledge, on ideas. So important has history (along with literature, etc.) appeared to some educationists that they have recommended it as the "centre" of their schemes for "concentration"; this was done by the Zillerian followers of Herbart, and even non-Herbartians like Mr. Somervell, in *Teaching and Organisation*, conceive of the possibility of "making history the backbone of higher education."

I do not adduce the usual arguments of the "faculty psychologists" in favour of the teaching of history. That it "trains" the memory, the imagination, and the reason, may be very true, but the truth is better expressed in Herbartian language. History, properly taught, endows the soul with an apperceptive interest in the past, present, and future of humanity; and where such an "interest" is present, the various "faculties" will look after themselves. The anonymous writer "Kappa"* sums up the possible realms of knowledge under the two metaphors of "The Palace of Aladdin" (the study of Nature) and "The Adventures of

* Let Youth But Know.

Sinbad" (the study of the human race); obviously these metaphors correspond exactly to Herbart's classification of interests (Vol. I., pp. 98-102). History, then, is the record of "The Adventures of Sinbad"—the strange adventures of man upon a tiny planet that came out of an infinite past, and moves towards a goal in the infinite future. Whosoever has no interest in that story—be he never so competent a student of science or mathematics—is a dull and half-dead soul; he lacks "apperceptive interest" in the most important story that can ever be told to a denizen of this earth.

When is history to be taught?

The Time Sense.

Investigations in the field of "child study" serve to indicate that up to a certain age a child does not fully grasp history *as such*—that is, as a chronological record of causes and effects in social and national affairs. Children have been tested by means of stories of kings, queens, sieges, etc.; and it was found that not till the age of ten or after was there any keen interest in the historical aspects of what was told (*when* the events took place). I do not press the inference too far. I do not say that we must be purposely vague, and slipshod, and rambling in our early history teaching. Still, we need not be anxiously solicitous about giving exact notions of time to young children. Indeed, it is generally admitted that myth and legend, with little or no reference to time or place ("long, long ago"; "far away over the sea," etc.) must precede history proper. Then will come biographies; then a fairly definite chronological study (reign by reign, or century by century, or epoch by epoch); lastly, a study of *topics*, such as the progress of the working classes, the growth of the constitution, and so forth, this last type of study merging into definite lessons on citizenship. Needless to say, our present schemes of history teaching are far removed from such a scheme as this.

What are the chief reasons for the low estate of history teaching?

The main reason is the low *esteem* of it. Fettered by our reverence for "faculty training," we do not regard history as very important, for even when we admit that it "trains" one or two "faculties," we generally allege that its training power is low. Consequently, though we give some attention to the subject, we cannot find in our hearts to assign to it more than an hour a week. I think that this weekly lesson, if taking the form of directing the reading of pupils to excellent books, setting problems, and discussing important points that arise, would perhaps be tolerably adequate; but so long as present methods are employed an hour is entirely inadequate.

Low Esteem of History.

The second reason for the low estate of history is that, though our teachers know Meiklejohn, or some other writer of outlines, they do not know Freeman, or Froude, or Gardiner, or Macaulay, or Lecky, or Gibbon. At least, if they know these historians, they do not apply their knowledge to their school work.

Another reason is that our reading-books are, for the most part, of a third-rate order. "Original sources" are hardly ever used in the primary school, though several excellent school books have been recently issued on this basis.

A fourth reason is one that applies to other subjects besides history—the non-recognition of the principle of correlation. It is quite a common thing for history to be taught without either systematic or occasional reference to geography, literature, or any other related subject.

These last three reasons resolve themselves into the first. If teachers had acquired, or been encouraged to acquire, the same interest in history as in several other subjects, they would not rest content with second rate and second-hand historical works; they would inevitably go to great writers, to original sources, and to literary works that throw light upon history. But history has never had a fair chance. As a result, most children do not like the history lessons, and most

teachers are, I think, in the same predicament. There is here, in short, a great lack of courage, originality, and power.

Inherently, history is perhaps the most "interesting" subject in the entire curriculum. The political speaker, or the preacher who introduces a scrap of it into speech or sermon wins at once the undivided attention of his yawning audience. Yet, though starting with better chances than almost any subject, history is a failure in almost all day schools, and scarcely exists at all in evening schools; the pupils have had enough of it!

To make some change in this state of affairs, I would urge the following points.

Use of the Great Writers.

The great historians should be studied by all teachers, and passages that will be suitable for class reading should be selected, and a list of them kept. For example, far better than the dry statement that Judge Jeffreys presided over the Bloody Assizes and condemned this person or that to death, would be Macaulay's vivid account of the same episode. Any teacher who could read that story with sympathy and vigour would be "teaching history" in the best possible way. Indeed, to deal with the later Stuarts, and to ignore Macaulay, is to confess one's incompetence as a teacher of history. I refer not only to Macaulay's *History*, but to his *Essays*, which, however, have also a bearing on other periods as well as the Stuart.

For the Tudor period there is, of course, Froude; and here again, as with Macaulay, we have not only a *history*, but a collection of essays—his *Short Studies in Great Subjects*. I can conceive of no better way of making real the year 1588 than by reading to a class *The Spanish Story of the Armada*. How infinitely better than the skeleton treatment usually meted out—the game of bowls at Plymouth, the Calais fire-ships, the storm.

I need not amplify the point. I am not urging the performance of any repulsive or laborious task. If to any

teacher the reading of great historical works is a weariness of the flesh, he has indubitably mistaken his profession. Indeed, the peculiar privilege of the teacher's calling is that his own culture is not a separate thing from his daily work, or his daily work a separate thing from his culture. A lawyer may study science or history as extraneous hobbies; for a teacher such hobbies should be a part of his professional equipment. His business should be his pleasure, his pleasure his business. No other calling is like it in this respect.

As soon, then, as a teacher leaves college and is appointed to a school, he should begin to index a list of famous passages from the great historians. No doubt English history will receive the greatest share of his attention; he will go to Green for the Heptarchy, Freeman for the Norman period, Froude, as already said, for the Tudor period, Gardiner and Macaulay for the Stuart period, Lecky for the eighteenth century (occasionally, also, for other periods, as the *History of European Morals* and the *History of Rationalism* cover a good deal of ground). The proposal sounds ambitious, but it is really not so. Life is before our young teachers, and though no one expects them to read all these great historians in a single year, there is nothing exorbitant in expecting that they should read them during the first five years of their professional life, and should have noted what passages from each are worthy of reading aloud to a class. Of course, if a young teacher has suddenly to prepare a lesson for next week, he will use such resources as are available—for example, the third-rate text-book. But as years go on, he should do better and better things than this.

Nor must other historians be forgotten, Gibbon least of all. England is not the only country that has a history; a few lessons on what has happened to other nations and lands are absolutely necessary. Every year our children are taught about certain learned "Greeks" who were expelled from Constantinople by the Turks, but I am perfectly certain

that the significance of the fall of that city is unrecognised, and that, indeed, the Byzantine Empire is not even a name to most English people. Great events like the Crusades and the Discovery and Colonisation of America should always be dealt with as world events, not merely in connection with English history. At the same time, though I think every English boy should know something about ancient, mediæval, and modern times (ancient through the correlation of Bible teaching with the history of Assyria, Babylonia, etc., Greek and Roman through stories, and through plays like *Julius Cæsar*), I do not suggest "thoroughness," which I recognise to be impossible. A few suggestive flights into the vanished past; a few suggestions for further reading; a few references to an historical chart—that is almost all that can be expected, except with regard to English history.

Use "Source Books."

The next reform to be mentioned is the use of original sources, modernised, of course, for class purposes. A number of "source books" have been issued during recent years, but they are rarely yet used in schools. If in any way we can interpose a barrier between first-hand knowledge and the child's soul, the school seems fated to do it. Some anonymous scribbler of unreliable history, who chooses to write a "school book" and arrange for its illustration, is preferred, both to the great historians and to the humble chroniclers who, centuries ago, told what they had actually seen or heard. Froude's scathing words about our neglect of Hakluyt should be engraven on the minds of us all.* It is, indeed, the strangest thing how the modern Englishman's mind seems to work in isolated compartments. He talks of "patriotism," and yet ignores the very documents which would give a meaning and a stimulus to patriotism.

Let our pupils be provided with a book of original sources†—

* *England's Forgotten Worthies.*

† Several "source books" have recently been published, such as *Illustrative History* (Horace Marshall & Son).

selections from Bede, from Asser's *Life of Alfred*, from the *Anglo-Saxon Chronicle*, from Froissart, from Evelyn and Pepys, from the speeches of Cromwell, Burke, and Pitt. There would probably be room for poetry, too, in such a book, literature and history here meeting in holy alliance.

The third direction which our reforms must take is that of correlation. The mention of "poetry," indeed, brings us face to face with this important subject.

Correlation.

Consider the use of Shakespeare in our schools. I do not for a moment suggest that boys can learn English history efficiently through the medium of our dramatist, though Marlborough (or was it Chatham?) is reputed to have done so. *King John* and *Henry VI.* are far from accurate in their presentation of facts, and even the other historical plays are not free from errors. But how anyone can deal with King John's reign, still more, how anyone can deal with the reigns of Richard II., Henry IV., and Henry V. (for the realisation of which Shakespeare provides us with a continuous pageant of four great plays), and quote *nothing* from Shakespeare is a mystery to me. Even the hybrid play of *Henry VIII.*, with its famous panegyrics of Sir Thomas More and of Queen Elizabeth, and with other matter full of historical suggestiveness, if not of truth—even this play is of value in history teaching. Any teacher with a wide outlook *and a free hand* is driven irresistibly, as it seems to me, to refer to Shakespeare, and to read passages from his works.

Consider especially the reign of Henry IV. As commonly treated, it is a dull business. The assassination of Richard, the persecution of the Lollards, the revolt of Glendower—these dry facts are detailed to a wearied class, and the teacher hastens on, with relief, to the more exciting campaign of Agincourt. Yet this very reign has been treated by Shakespeare with a fullness quite unique.

An Example:—Shakespeare's *Henry IV.*

I do not dogmatically assert that during the actual "history lesson" anything more than a few selections from Shakespeare, read by the teacher, with brief comments and explanations, is necessarily demanded. But here is the play staring us in the face; and I certainly do urge that, in some lessons, at any rate—call them "literature," or what you will—substantial portions of the play should be dealt with, and the private reading of other parts be suggested to the pupils.

No doubt there are historical blunders in the play, notably the one concerning the identity of Mortimer; dates, too, are frequently wrong; the battle of Bramham Moor actually took place in 1408, instead of immediately before Henry's death;* but, broadly, the play seems true to history, truer, at any rate, than the dry outlines usually employed for lessons on the reign. Let us review the reign for a moment.

Eight years after he had sent an archbishop to the block, Henry Bolingbroke lay dying. In the eyes of the superstitious —and all men were then superstitious—it had seemed that the heavens themselves were angry with the usurper, for a loathsome leprosy had followed the sacrilege, and the bold and handsome features, which had played no small part in the winning of a crown, were now hideous with disease. And foul deformity was not the only misery that dogged the steps of him who had once, amid popular applause, faced Mowbray in the lists of Coventry. Often and often would Bolingbroke lie stricken and unconscious in the grip of epilepsy.

A scambling and unquiet time had been his reign. By-paths and indirect crooked ways had led him to the throne, and, seated upon it, he had become the type for all ages of royal unhappiness and disquiet; "uneasy lies the head that wears a crown." A fatality seemed to follow all his acts.

* Accession 1399, Shrewsbury 1403, Gaultree 1405, Bramham Moor 1408, Death of Henry 1413.

He had cast to the winds the oath made at Ravenspur; and it was the Percies, who had connived at the perjury, that became the bitterest of his foes; Hotspur fell at Shrewsbury, and Northumberland, four years later, at Bramham Moor. It was in Wales that good fortune had smiled upon him; it was in Wales that Glendower raised the banner of successful revolt. Rivalry with a Mowbray had been the first step in the process of Bolingbroke's ascent; another Mowbray became a rebel, and perished at York. Richard he had had murdered at Pontefract; but the ghost of his predecessor haunted him; Richard was again and again reported as alive.

Now all this (and ten times more) is brought out in the two parts of *Henry IV.*—brought out not in dry outline but with the hues of reality, or at least of historic imagination. The revolting Archbishop moves before us, is captured by a trick in Gaultree Forest, and pays the last penalty with the younger Mowbray at his side. The Percies play an even greater part. The curtain rises on their quarrel with the King; it falls soon after Bramham Moor. All three men stand out clearly—the reckless and noble Hotspur, the perfidious Worcester, the vacillating Northumberland. Glendower, too, stands before us, the great magician who was reputed able to "call spirits from the vasty deep," and did, indeed, defeat nobles, Prince of Wales, and King time after time. We are told of him in the first scene, and he is ever in the background, nor, in point of fact, did he vanish from history till about the time of Agincourt. John, Duke of Bedford and Humphrey, Duke of Gloucester, whom the schoolboy yawns over in reading the wearisome reign of Henry VI., stand before us as living men, or rather as living youths, in this play, and we no longer wonder that he who crushed the Archbishop's rebellion was afterwards the bulwark of the state in the French wars. Above all, the King himself stands before us weary with strife and disease, at one moment in a fatalistic mood (II. III. i.), at another recurring to his crusading projects—absurd at that

time, for Constantinople itself was soon to fall before the Mohammedans; still, a crusade might not only busy giddy minds with foreign quarrels, and thus "waste the memory of former days," but do something to win the favour of an alienated Heaven.

Judge Gascoyne, too, is here; and, though the play tells us nothing of his refusal to pass illegal sentence on the men captured by Westmoreland's trick in Gaultree forest, we hear of his other and more famous exploit—the committal of the Prince for contempt of court.

The play is as rich in incident as in character. How many English boys have any clear idea of the most fiercely contested battle ever fought on English soil? Shrewsbury was not only that—it was peculiarly rich in elements that interest youth. Here the famous English archers found themselves matched against each other; here Douglas and Percy raged and ranged over the field, seeking out and slaying every royally-caparisoned champion, and at length assailing the king himself; here Prince Harry won his first fame. It is a surprising fact that, though our school histories invariably and religiously tell the story of the Black Prince winning his spurs at Creçy, the parallel story of Henry of Monmouth is never told. Shrewsbury is only a name. Yet it is to this battle that Shakespeare has devoted an entire act.

Something of the real meaning of mediæval feudalism will incidentally come to the student. The power of the great nobles is obvious throughout; their claims upon their followers are referred to by Coleville in the second part.

> "I am, my lord, but as my betters are,
> That led me hither."—IV. 3.

And there are other sidelights upon the system, as, for example, in the King's claim with regard to the Homildon prisoners. Old modes of thinking are referred to more than once; the Archbishop scrapes Richard's blood from Pomfret stones, thieves are hanged, prisoners are tortured, and so on.

True there are many things in the reign of Henry IV. of which the play makes no mention. It was in this reign that the most formidable French invasion known to our annals took place. In alliance with Owen Glendower the French army marched from Milford Haven to Worcester, returning to France unbeaten. There is the Lollard persecution, too. But allowing for all errors and silences, there is plenty of historic truth in this play.

On the literary side, too, the play has much to commend it. The opening of the Second Part—where rumours of Shrewsbury battle come flying to Warkworth—seems to me full of impressiveness. Whether the Falstaff scenes are suitable for treatment in school is somewhat questionable; in connection with history they are certainly unimportant; but in the literature lesson they may, perhaps, be dealt with, though not in much detail. The practical joking would certainly appeal to boys more than much of Shakespeare's humour.

There are even more important aspects of the question than any I have hitherto considered. Mention has several times been made of the fact that there are earnest proposals in the air for direct moral instruction, and until our curriculum is rendered truly humanistic such proposals will probably be made again and again. I would point out, therefore, that the thoughtful treatment of such a play as *Henry IV.* would do much to render all such proposals unnecessary.

Note, for example, how the following moral problems are touched upon: Intemperance ("Thou art so fat-witted with drinking of old sack. . . ." I. i. 2); cruelty to animals ("Struck his armèd heels against the panting sides of his poor jade." II. i. 1; "The poor jade is wrung in the withers out of all cess." I. ii. 1); peace and amity ("A peace is of the nature of a conquest, For then both parties nobly are subdued, And neither party loser." II. iv. 2; there are many other passages on the subject); courage and conscientious-

ness, as represented by Judge Gascoyne in Part II., and magnanimity, in the corresponding conduct of the newly-ascended king, Henry V.; filial and paternal relationships (see the first scene of the play, in which the king laments the conduct of his son, and the great death-bed scene towards the end [II. iv. 5], in which the two men understand each other at last); the folly and blindness of anger, as exemplified in Hotspur (note his utter lack of self-control in I. i. 3; his avowed pig-headedness, "I'll give thrice so much land To any well-deserving friend; But in the way of bargain . . ."; his mad threat, "I will ease my heart, Although it be with hazard of my head"; and Worcester's reproof in I. iii. 1, "You needs must learn, lord, to amend this fault . . ."); courtesy (exemplified in Hotspur's welcome to Blunt, and the Prince's words to Worcester, I. iv. 3 and I. v. 1); avarice (II. iv. 5, "How quickly nature falls into revolt When gold becomes her object . . ."). .

Problems of "citizenship," too, crop up. "Rumour's" speech, which opens Part II., has a good deal of significance in these days of a sensation-mongering press; the trick by which Westmoreland brought about the surrender of the rebels (II. iv. 2) has had its parallels in international relations; and so on.

I am not committing the unpardonable (?) offence of suggesting that Shakespeare should be regarded as a book of texts for moral exhortations. My belief is that the line between the historical, the literary, and the moral need scarcely be drawn at all when such a play as *Henry IV.* is under consideration. But I certainly should not hesitate to refer to such moral questions as naturally arise in the course of the play; it would seem to me both pedantry and neglect of duty not to do so, though, of course, there is no reason why "priggishness" (whatever that rare and mysterious vice may be) should receive encouragement. What better way is there, for example, of showing that high patriotism

is not confined to the sons of England than by the stories of Glendower and Douglas?

If I have said little about the other historical plays, it is not that I ignore them. *Richard II.* and *Henry V.* are continuous with the play I have been considering; indeed, the first plot against the usurper is described by Shakespeare in the closing scenes of *Richard II.*, and the carrying out of his warlike policy is the subject of *Henry V.* The four form one splendid pageant. The Northumberland and the Hotspur of the earliest play desert Richard; in the second play they desert Henry. The Aumerle of the first play—traitor to Richard, traitor to Henry—reappears in the third play as the Duke of York who dies at Agincourt, and the narrative of his death seems to redeem the perfidy of his life. In the third play, too, as in the second, John, Duke of Bedford and Humphrey, Duke of Gloucester—to most schoolboys mere names associated with the dull chaos of the reign of Henry VI.—take on flesh and blood.

Of high political import, too, are many of the questions that these plays force upon us. The debate between William and Henry of Monmouth when day was breaking on the field of Agincourt is a Hague Conference in miniature.

I must pass rapidly over all other suggestions for the improvement of history teaching. Once we have realised the importance and fascination of history—once we have come in contact with the great historians and poets—the minor details of our teaching will take care of themselves. Yet one matter is so entirely neglected that I feel I must refer to it.

The Study of Prehistoric Man.

To the best of my knowledge, there are not a hundred children receiving at school any knowledge of the appearance and early development of the human race on the earth. The most significant of all historical changes, immeasurably more important than any that followed, is almost entirely left alone. Teachers who are not afraid to take

independent lines may well be invited to make some humble experiments here.

What a vista is opened up by the discovery of the bones of the Neanderthal man,* bearing the very marks of the final battle for life to which he succumbed! What suggestiveness lies in the fact that the great ice age was almost synchronous with the appearance of man on the earth, and that very probably he would never have become what he is in intellect and morals but for those "hard times" when a big brain meant survival and a small brain death. Even if, as many anthropologists believe, man originated in some continent of "Lemuria," situated where the Indian Ocean now rolls, and providing him with food in such variety that he no longer remained herbivorous—even if this be true, man's higher evolution was the result of later and more stringent conditions. It was probably then that he acquired solidarity, and with solidarity speech, and with speech reason.

What suggestiveness in the "Kent's Cavern" discoveries of half a century ago, when, above the stalagmite of the cavern floor, were found the familiar signs of primitive habitation, and then, below it, and therefore of an immensely greater antiquity, other remains that showed man to be contemporary with the extinct animals of the ice age!

"Nature study" is incomplete unless some hint of these discoveries, and of their significance, is given by the modern school. Our children are sometimes told about "stalagmites" and "stalactites." What a story clusters around those stalagmites, which sealed up, ages ago, the evidence of man's immeasurable antiquity! "Correlation"—yes, here is correlation indeed, with romance thrown in. In the presence of those ancient stalagmites, the study of Man and the study of Nature blend into one.

* 1857. Other similar skeletons have been subsequently discovered. They show characteristics but little removed from those of the ape. The Neanderthal skeleton bears marks of physical violence, as above hinted.

I do but urge that, in this twentieth century, the school should do something to ensure that true views of man's origin and evolution should prevail. In a little book, *Days Before History*,* a little of this is attempted for junior and infant schools, and hints to the same effect have been embodied in the works of Dr. Dewey, and in various proposals to use *Robinson Crusoe* as "concentration material." Now and then a teacher gives a lesson on the "Stone Age" or the "Bronze Age"; but the full significance of what is being taught is rarely recognised. And yet, surely, if the first task of the school is to give to children an "æsthetic revelation of the universe," or, in other words, to arouse a living interest in Nature and in Man, matters like these are of the very first importance.

The invention of language and the discovery of fire; the far later invention of writing, of rafts, of boats, and subsequently of ships; the rise of agriculture—to deal with these matters will be regarded as inevitable in the history teaching of the future. And just as history and nature study come together in the stalagmites of Kents' Cavern, so history and science come together with the discovery of fire, the invention of the compass, and so forth. There are links, too, with art, with woodwork, and with needlework.

I feel inclined to close the present chapter at this point. "Study history" is the first rule for the teacher of this subject. And the second is like unto it: "Study history." And if I had to give a third, I would still say, "Study history." A teacher whose mind is full of vivid, living, meaningful history, anthropology, and folklore, cannot very well be an unsuccessful teacher, unless, of course, he is tied down helplessly to a scheme with which he has no sympathy. In this last connection I would urge, as also in connection with geography, that any class teacher who is in earnest with this subject must be given a very free hand; he must be allowed to fill in

* By H. R. Hall (Harrap & Co.).

details for himself, and even, in part, to suggest the lines along which his class should be examined. For a teacher who is *not* in earnest a rigid syllabus may well be provided, and he should be expected to adhere to it. Liberty is only for those who can use liberty aright.*

"Study history," then, is the chief rule for the teacher. But there is one more: "Keep the doctrines of apperception and interest prominent before your mind." In other words, the teacher should make use of the knowledge, the existent ideas, the prevalent tendencies of the child, and seek to establish links of association or connection between these and the new knowledge to be imparted. Here comes in the value of visits to historical buildings, etc., in the school neighbourhood. Sometimes the child's knowledge of these things gives apperceptive interest to the teacher's instruction; in other cases, his instruction must give apperceptive interest to the buildings, the child being informed, *in advance*, of their significance. I scarcely think that there should be special lessons in local history as such, but every teacher should set himself to know such local history as there is, and to introduce it into his ordinary history lessons. For example, the fact that John Wesley preached a sermon in Bethnal Green Parish Church in aid of the families of the English soldiers who fell in the American War, has been employed by a teacher in the East End; and the fact that a public house in North London received the name of the *Rose and Crown* because James I. was welcomed there in 1603, has similarly been found to enhance considerably the interest of local boys in the events of that year. Indeed, there is a good deal of history connected with public house names, *e.g.*, *The Saracen's Head* is a point of contact with the Crusades. Local passages from *Doomsday Book* and *Pepys's*

Apperception.

Local History.

* "When I meet a person who does not find history interesting, it does not occur to me to alter history,—I try to alter *him*."—SEELEY's *Expansion of England*.

Diary serve the same purpose, that of making history vivid and real. The teacher should also be on the lookout for modern parallels to historical events; between modern strikes of railway men and the trade guild struggles of the Middle Ages, between the work of the Salvation Army and that of the preaching friars; and for such links of connection as that between the debt clause in Magna Charta and the modern "judgment summons" (far from unknown to the parents of our schoolboys). With all our teaching about the Reformation, there is much doubt whether any of our pupils could describe the difference between the services in the parish church of to-day and those of the parish church of five hundred years ago. And if any reader imagines that such intimacy of detail as this is impossible in the Elementary School, I would remark that the eight or more points that have just been detailed are taken from actual class work in the East-end.

The child's fondness for stories will suggest the employment of historical novels; a few hints, warnings, and elucidations may accompany a list of such novels, hung up in each of the senior rooms.

The child's fondness for puzzles may be made use of by the skilful teacher, in the way indicated by Mr. Somerville;* a rough, whimsical, enigmatical drawing (*e.g.*, a small ship beached on the shore, where stands a notice-board, "For Sale, *The Daring Polly*") serves to suggest the effects on smuggling of Pitt's financial policy. In various much advertised works on history, there are frequently found pictures showing mediæval or Tudor castles with the *Union Jack* (!) waving proudly over the battlements. Here is another chance for a puzzle and a problem. The use of historical pictures is a distinct question from this last. Such pictures (if really good and reliable) are not used half enough in schools (the whole tragedy of the Civil War could be

Use of Pictures.

* *Teaching and Organisation.*

brought out by a thoughtful study of the picture, "*When did You Last See your Father?*"); but some authorities consider that the most useful pictures of all are those of an informative rather than artistic character—portraits of famous men, historical places, cathedrals, armour, etc.

Research Method.

Great interest is aroused by stimulating the desire for research. A series of questions (not merely *memory* questions of the usual type) may be set before a certain chapter is read. Clearly, however, this plan assumes the power of fluent reading. In upper standards, the research method should perhaps go along with the use of the "source books" above referred to. After the teacher has given a number of oral lessons, the time has arrived when the class may make use of one of these books—or of a passage from them reproduced on a separate sheet of paper—and be directed to solve a series of stimulating problems. For example, Chaucer's prologue to the *Canterbury Tales* gives a vivid picture of late mediæval life; and the pupils may well be directed to discover the condition of the Church as depicted in the persons of the friar (who objects to poor people!), of the pardoner (with his "pigges bones" on sale), of the monk (who loves to hear the bells—of the chase!), of the poor but worthy parson, and of the gentle prioress.

Dates.

To what extent should *dates* be learnt? It is almost needless to repeat that they should not be learnt for the purpose of memory training. Memory can best be "trained" through interest. Lord Beaconsfield's wife could "never remember which came first, the Greeks or the Romans"; and hardly any modern Englishman is able to date King David. Any person who had really read and enjoyed history would never suffer from such an incapacity. Few minds can retain meaningless dates; but most minds can retain the sequence of really significant facts with wonderful fidelity. Still, a mechanical scaffold-

ing of dates is highly desirable, and this may either be of the nature of a "line of time" or of some such device as Mr. Hodgkin's,* who takes the conventional date of the founding of Rome (753 B.C., a date easily remembered, as its three odd digits descend by equal steps), and maps out history in periods of 753 years, or thereabout. The founding of the Babylonian monarchy will be nearly 10×753 years B.C., that of the Egyptian monarchy, under Menes, 5×753 B.C., Isaiah and Lycurgus will fall close to 753 B.C., while halfway down the cycle then commencing will occur the golden age of Greek thought. Most teachers will probably prefer to work by centuries rather than epochs, but, in any case, a scheme of some kind is needed, and as the majority of people are visualisers, the scheme had better be of a pictorial character. It should hang on the wall of every room in which a senior class is being taught, and should be referred to the moment an historical question comes up. The dim vistas of prehistoric ages should be somehow suggested on the chart, as well as the clear-cut centuries of historical times. Moreover, we must make more use of *approximate* dates than we do at present.

If history is ever to take its rightful place in the school, teachers must determine resolutely to throw overboard such facts as do not bear on great biographies, great episodes, and great movements. Children may be allowed to read as many facts as they like—the more the better—but actual class work must make use mainly of facts that are significant. Consequently, many genealogies, marriages, and battles will be entirely ignored, or only referred to in passing.† The teacher must employ his utmost care and knowledge in dealing with the really great concerns of history—unless these are presented

* Leaflet No. 10 of the Historical Association.

† An important distinction! The teacher may *teach*, or at least refer to, many facts which may not be made the themes of examination questions. Until this distinction is recognised by head and assistant teachers, history cannot be taught with much intelligence.

truthfully and vividly, he is not a good history teacher; but the minor matters—the facts that fall outside the major concerns—can be relegated to the private study of the pupils, or to the casual method of the reading lesson. There must, in short, be far more sense of proportion than at present. Ignorance of certain facts is infamy; ignorance of others is unimportant. We must avoid teaching history after the fashion of Mrs. Nickleby's narratives, in which the weighty and the puerile jostle chaotically side by side. This is the reason why the soundest history can often best be taught through a great picture; art seizes the important and significant aspect of things; thus, in the fine picture to which reference has already been made, the whole history of the Commonwealth epoch can be read. Another fine picture is Millais's *Mercy*, which depicts a scene during St. Bartholomew's massacre; a monk is beckoning a soldier to enter a house and kill the inmates, while a nun is holding the soldier back. How infinitely more humanising and helpful are such pictures than the hideous *Charge of the Light Brigade*, with its suggestions of brutality and incompetence, redeemed by frenzied courage! How a *song* or *poem* may, in like manner, summarise and interpret an epoch will be shown in a subsequent section. The attempt has never, to my knowledge, been made; but an intelligent teacher could, I doubt not, teach all the later, and, perhaps, even the earlier, centuries of English history, through a number of great pictures or songs.* *And the children would remember the history thus taught, because it would be significant history, history that came home to their "business and bosoms."* The use of great political speeches has already been mentioned; upon them, too, a large mass of history teaching could be based by any teacher who preferred that plan.

Proportion.

* *E.g.*, Shelley's *Masque of Anarchy*. Ebenezer Eliott's *God Save the People*. Kipling's *Recessional*.

And now, as this chapter comes to a close, matters, scarce hinted yet, clamour for recognition. But some of them will be found in the pages that follow, and I would therefore impress upon the reader that, though the chapter on history closes at this point, the subject of history does not.*

(F. H. H.)

* See, for example, under "Drawing."

CHAPTER VII.

Geography.

EXTREMELY significant and rapid changes in the theory of geographical teaching have recently taken place. I do not think those changes have appreciably affected the practice of the elementary school, but it is time that they should do so. There is enough liberty to render this possible.

Perhaps the most important change is in the direction of adopting *regional* in place of political divisions; or rather of giving to the former a greater prominence than to the latter. The meaning of "Regional Geography" can best be shown by an example.

"Regional" Geography.

There is a "Mediterranean region," characterised by winter rains and summer droughts—a "semi-desert" condition, unfavourable to many plants, but favourable to the vine (whose long roots enable it to obtain moisture where little is to be found); to plants like the orange and citron (whose thick-skinned leaves allow of little evaporation); and to bulbous plants, which store moisture in large quantities. Now, the shore of the Mediterranean is not the only "region" where such conditions prevail; Cape Town is another; Victoria and small portions of South and West Australia a third; California a fourth. Thus the "Mediterranean type" is quite clearly marked.

Again, there is a "China type," which includes not only China itself, but New South Wales, Natal, Uruguay, and the

south-eastern States. Now, though countries of the "China type" have much the same latitude, temperature, rainfall, and often even soil, as countries of the "Mediterranean type," the productions are different. Tea will not grow in "Mediterranean regions." The reason is that the rainfall is in summer, not in winter.

Mr. Herbertson tells us that there are some sixty or seventy "natural regions," themselves reducible to fourteen types in the broadest sense. Obviously they are not related to the artificial political boundaries of modern countries. The "regional method" of teaching geography is a method, then, which divides the world up into natural *types* of climate, and therefore of productions. Probably, however, regional geography cannot be attacked without a preceding course on winds, vegetation zones, etc.

Commonly, though certain laws of "climate" have long been dealt with in schools, the treatment of these laws is in partial isolation from the rest of the geography lessons. Moreover, though questions of temperature and rainfall are briefly discussed, the equally important question of seasonal changes in these respects is almost, or quite, ignored; *must* necessarily be ignored so long as sixty or eighty minutes a week constitute the maximum time assigned, or, at any rate, so long as scientific and unifying concepts of climate have not been formulated. Such concepts, however, thanks to the advocates of "regional" methods, are now available. To take the example just given; instead of describing the climate of Cape Town, of Victoria, of California, merely in terms of temperature and rainfall (which would mislead, inasmuch as there may be winter rain and summer drought, or *vice versâ*), we can describe it as belonging to the "Mediterranean type." At once we have a clear indication of climatic conditions, and even of probable productions. Facts are linked together; geography has become a science. Again, where rains are

continuous, forests abound (Congo basin, Norway); where summer rains predominate, grass land is the rule (Soudan, South-east Europe), though geological circumstances may, of course, introduce disturbing factors. Again, though we hear about the "trade winds," we rarely recognize that the existence of deserts in the west of the great land masses is connected with the direction of these winds.

Perhaps an equally important reform is that involved in the use of original sources of information. The history of Education is one long history of efforts on the part of many teachers to erect barriers between real things, real events, real scenes, real literature, and the pupil; and of other and wiser teachers to throw those barriers down. Third rate and third hand "histories"—third rate and third hand "geographies"—these are but examples of the former tendency; the introduction of "source books" in history and geography alike is an example of the latter. Why, indeed, should we not read the records of travellers and discoverers? Are such records dull?

"Source" Method.

Notoriously they are *not* dull. Books of travel are delightful, and they are especially delightful to boys. They deal, too, with *real* geography, not with meaningless, or almost meaningless, names; we feel the tremors of the snow-capped volcano, we hear the swish of the river among the reeds. The boy finds no difficulty in "remembering" the dampness of Hong Kong when he has read that mushrooms are inclined to grow on the boots (!) of the residents. Travels, too, are full of *human* interest; countless deeds of daring, of sacrifice, of thoughtfulness, of sagacity, had to be done before this world was made known to its denizens; and even the tamest and most modern tale of travel has some such elements as these, some narrative of friendship, or resolution, or mercifulness. It has been said that every few square miles of Africa mapped out by explorers

and surveyors have cost a human life. The reform of geographical teaching will have proceeded apace when "source books," or improved "readers" like those here referred to, supplemented, doubtless, by lessons of the more usual type (to fill up gaps and systematise the knowledge acquired), are in use in every school. Or perhaps the source books should be used in the course of the "reading lesson" proper, and the geography lesson continue mainly oral. The school library should contain many books of travel.

At this point a question of organisation suggests itself. No doubt, if a teacher, instead of devoting a lesson to the teaching of a series of mere names and facts,* reads to his class a selection from the voyages of the Elizabethan navigators, or from the travels of Mungo Park or Livingstone, it will be necessary for his class to be "examined" in a somewhat different way from the present. "Give ten productions of Africa" will not do justice to such teaching. The teacher, though bound by the broad lines of his syllabus, will therefore state before his class is examined the selections he has employed, and the head teacher's examinations will take account of these. Indeed, I see no harm in the class teacher being allowed to prescribe two or three questions himself, in order that the most individual portions of his work may be fairly assessed. If he prescribe threadbare or common-place questions the head teacher will draw his own inferences. "Describe a voyage up the ———," will be the

* This depreciatory expression needs safe-guarding. "Names" and "facts" are of the utmost importance; geography has no existence apart from them. But the "names" must have a rich connotation, the "facts" must be genuine and living facts. The list method prevents this. A boy may be able to roll off the names of twenty Russian towns, and even locate them on the map, without having anything like the living knowledge of Russia possessed by a boy who has read a book of travels. The constant protests against "names" and "facts" is a protest, not against real but against fictitious knowledge. The value of real knowledge cannot be overestimated. Yet some radical reformers would go so far as to say:—"The sooner people get out of their heads that geography should enable them to know where any place mentioned in the newspaper is the better. What should be the aim is that, having found it, they should at once be able to say much about it; as to climate, why it is situated where it is, and so forth." Perhaps the reformers are right.

new type of question. At the same time, I see no harm in the use of a book of geographical outlines—mere "names" and "facts"—provided this is used *after* the rich and real geography of a region has been taught by the means indicated. Such books serve to summarise, fix, and extend the knowledge acquired, but as they are essentially formal, dry, and systematic, instead of real, living, and spontaneous, their place is second, not first. "From real to formal, from concrete to abstract, from vivid to systematic," are maxims which have here great force. "Give ten productions of Africa"—yes, there will be plenty of room even for such questions as this, and, better still, our pupils will be asked to say "why they are found there."

Humanisation of Geography.

Something has already been hinted as to the possibility of humanising geography—of partly transferring interest from places to persons. This constitutes the third line of reform. Men are interested in the earth mainly because they live on it, because it is the arena of their struggles, failures, and achievements. A mountain that no man has ascended, a cape or islet that no ship passes, a river that bears no human freight, are less interesting than mountains baptized like the Matterhorn in the blood of its first conquerors, or consecrated, like Fuji-yama, by the wistful adorations of a nation; than capes like that of Good Hope, which beckoned the Portuguese to the East; than islets like Tsu-shima, which witnessed the unequal struggle between Muscovite and Japanese; than rivers like the Tigris or the Tiber, which once saw the sceptre of the world lying on their banks. We need but small philosophical training to learn that geography has little or no significance apart from man.

History and geography, literature and geography, have to be brought near together, in spirit as well as in method. We hear much about the supreme moral value of history and literature. These subjects present us with man as he has been

or may be, as he has acted or thought. But the moral value of geography may be fully equal to that of these rival subjects. I am not echoing the cant of the advocates of "formal training," that there is a moral value in all subjects, that all subjects "call forth" honesty, application, perseverance, and the like; such a claim is either so childishly obvious and insignificant as not to require the urging, or so entirely false (if it mean that training is identical with instruction, and can take its place) as not to require refutation. I claim that there is actually moral instruction—not merely moral training—in geography as I conceive it. Let me illustrate.

On a certain Empire Day, a visitor asked a class of pupils what they thought of the Chinese. The only answer forthcoming was that they were "treacherous." Nothing was known of their filial love, politeness, industry, reverence for knowledge. Advocate though I have been of direct moral instruction, I believe that if our geography were made humanistic by embracing in its scope the vivid portraiture of the various nations of the world, and especially of their characteristic virtues and achievements, the time needed for specific moral instruction would shrink almost to nothing. Indeed, much of the moral instruction that has recently been suggested consists in stories illustrative of the morals and customs of various nations—exactly the kind of "geography" here advocated.

Lower Standard Geography.

Few teachers, I think, are satisfied with the ordinary geography schemes for the lower standards. The "plan of the school" is supposed to teach the use of the map, and to afford a basis for wider knowledge of the world, on the principle of "From near to distant." Yet experience shows that, however "logical" such a treatment may be, it is not "psychological"; the lessons are a weariness of the flesh to teachers and scholars alike; while lessons on the cardinal points are

almost impossible in a class-room, and are altogether too abstract for young children.* On the other hand, lessons on the Chinese, the Negroes, the Red Indians, are intensely interesting, and along with talks on trees, animals, etc., may rightly form the staple geography (which here merges into broad "nature study") of the lower standards. Mathematical treatment of geography is, I think, out of place—all "proofs of the earth's rotundity," all explanations of day and night, etc., except so far as these can be given in a semi-romantic or poetic fashion.† If, too, geographical "definitions" are taught at this stage, the sand-tray or clay model is essential. Little paper boats may be made to sail over the "lakes" and "oceans," little toy carriages to take journeys along the roads, and so forth. Even more essential is the actual sight of such lakes (or ponds), rivers, hills, etc., as exist in the neighbourhood of the school. Many children of the East-End have never seen the Thames, have never seen a real "hill"; a stagnant canal with barges is their only means of approach to the former, a slightly rising road like Stamford Hill, with houses and tramcars, to the latter; many children are without even that amount of basal experience, having never in their lives gone out of the dingy neighbourhood where they were born. But I very much doubt whether much time need be spent on "definitions" at all. No one ever defines "road," "house," "king," and yet children pick up the meanings of these words easily; and I believe that if we were more spacious with our geography teaching, all necessary "definitions" would come of their own accord.

Definitions.

* I speak from observation. "North" means for most Standard I. or II. children a particular part of the wall of the room; if the children are shifted to another seat they will still point to the same part. I doubt whether, except in a very large field or playground, the "cardinal points" can be taught at all. The very word "point" is bad. By the way, maps should sometimes be laid *on the floor*.

† But much work, *e.g.*, measuring shadows cast by the sun at different times in the year, and so forth, can be done quite incidentally even in the lower standards; scientific explanations, however, must be postponed.

The main thing, however, on which I would here insist, is that the parlous condition of geography teaching in the lower standards can be removed by laying far more stress on the human and living element. More genuine geography can be learnt from *Jungle Book*, from folk stories, and the like, than from what passes at present as the correct kind of pabulum. Above all, there is *Robinson Crusoe*, a veritable goldmine of "definitions." There is hardly a geographical fact of importance that cannot be taught in connection with Defoe's romance.

The Topical Method.

A method that is sometimes advocated, and occasionally used, is that of "topics." For example, a certain trade or industry (tea, timber), or a certain question of the day (Chinese labour, Indian famines), may be the "topic" for a definite lesson. The plan is scarcely adequate for general purposes; the lessons tend to be isolated from each other, following without logical connection. But there is no doubt that in the upper classes of a school the "topical method" is occasionally useful, or even admirable. It lends itself especially to criticism lessons by visiting teachers, and to occasional lessons by the head of the school. I must also refer here to what may be called the "incidental method"—really the topical method on a small scale. The teacher seizes any episode, *e.g.*, a shipping disaster, to refer to the chief commercial routes; or, learning that a boy's father is a milkman, he traces out the railway journey of the milk on the map; posters such as those of the Great Western Railway are referred to or employed; and so on. Hints of this kind, however brief, greatly help the formation of a wide circle of geographical thought.

Another method might be regarded as almost ideal, if only circumstances permitted of its general application. This is to start with the geological formation of a country (illustrated by a geological map); to deduce from that its soil, minerals,

and productions, the probable sites of its towns, the directions of its roads and railways, its scenery, even (in Buckle's fashion) the characteristics of its inhabitants.

Geological Method.

The method, especially if combined with the climatic considerations that are prominent in the "regional" treatment, is undoubtedly "scientific" in the truest sense. But, unfortunately, there is little or no room for geology in the primary curriculum of to-day—even conventional geography has to fight for its existence—and therefore, though the method here briefly indicated has a great future before it in certain departments of educational work, and will some day come to its rights even in the primary school, I doubt whether there is much likelihood of its adoption for a considerable time to come. Yet I would urge the claims of geology upon teachers. It is a subject that can be studied with comparative ease, and it repays the study of itself at compound interest. The geography of *one's own* country certainly should be elucidated by geological considerations whenever this is possible. Dozens of geographical myths, such as the one that attributes to the force of the Atlantic waves the rugged coastline of western Scotland,* would be abandoned at once if the relations of geology and geography were better known. The correlation of geological facts with scenic effects has been worked out by Professor Geikie, Lord Avebury, and others, and teachers should make themselves fully acquainted with such matters.† The leading facts about chalk, granite, slate, etc., should be made known, if possible as a result of outdoor work.

An ideal plan would perhaps be to start with the physical (geological) structure of a country (here the study of contours is important); then to deal with winds, rainfall, and latitude;

* Fiords are due to glacial action followed by submergence. Sea erosion has nothing to do with them. Indeed, the east coast of Britain is notoriously yielding faster than the west to the ocean waves.

† *A Scientific Geography*, by Mr. Heaton (Ralph, Holland & Co.) lays stress on geological matters.

then to divide the country into natural areas (coal fields, grasslands, etc.); and then to use this knowledge as a basis for the study of other countries. Secondary schools could do this; in primary schools the available time is entirely inadequate.

These, then, broadly speaking, are the directions which our improvements in geographical teaching are likely to take. What do we find at present? Instead of the "regional method," we find that lists of capes and islands are still learnt, and that important and unimportant ones are learnt almost equally, relative importance being necessarily ignored, in large measure, when a "name method" is employed. Flamborough Head appears not as the end of a Yorkshire chalk range (as it would in "geological" treatment), but as the first in the list of capes; and its kinship with North Foreland and Beachy Head is unrecognised. Liverpool is learnt among the towns of Lancashire, Birkenhead among those of Cheshire.

It must be admitted that there is a certain value in this old-fashioned "name method." But its utility seems to me confined mainly to lessons of "revision." After a "region," great or small, has been studied, the teacher may very well test the memory of his class by pointing to capes, islands, or towns in succession, and asking for their names. Used more extensively than this, the method seems feeble, or even pernicious. It robs names of their significance by robbing places of their background. The method is essentially pre-scientific; it fails to explain, it fails even to correlate.

A matter of considerable importance is the necessity—I scarcely dare say for "revision," the word too often implying a going over of old ground in exactly the old way, a process devoid of apperceptive interest (*see* Vol. I., *p.* 92)—for a few general lessons on *world*-geography in each of the later school years. Whatever be the countries or continents selected for

special study, this world-geography should not be neglected. No child, after the stage of Standard III. should be ignorant of the names of the chief countries, nations, and physical features of the world. It is too often forgotten in schemes of work that many children leave school without ever entering Standard V.; these children will grow up without any real idea of the earth's surface unless some such lessons as those suggested are provided. Whether the lessons take the usual form or that of "journeys," of talks on commerce, or the like, is a minor matter. Needless to say, the more specialised geography of particular continents, or of the British Empire, will be aided by this general geography. Some teachers would even recommend the systematic adoption of the "concentric method" alike in geography and in history: the geography of the World and the history of England being covered *each year* in increasing detail.

"Revision."

This section will have been written in vain if the reader has not realised how admirably adapted is the subject of geography for purposes of correlation. The late Francis Parker of Chicago emphasised this fact in his scheme [Vol. I., *p.* 130]. But even though we regret any attempt at definite "concentration," we must admit that geography occupies a "central" place in the scheme of studies; dealing as it does both with nature and with man, it feeds both of our leading kinds of "interest" [Vol. I., *pp.* 99-100]. A few specific hints for correlation may here be mentioned.

Correlation.

Geography provides admirable problems for *arithmetic*. Consular Reports, Blue Books on Agriculture, Board of Trade Returns, the "Statesman's Year Book," etc., may be employed as a basis for calculating sundry percentages and averages. Distances and areas may be measured or calculated from good maps (squared paper is here useful), and even railway time-

tables may contribute to work of this kind, which thus becomes a form of *research*, and has all the advantages of it.

Nature study overlaps geography at many points, The study of rocks, vegetation, etc., both in lessons and on school excursions; weather records and charts; the encouragement of first-hand astronomy, that is, of observing where the sun and moon rise and set, the chief constellations, and the journeys of moon and planets through those of the zodiac; the direction of shadows at different hours of the day: these are some of the many methods by which "nature study" and "geography" may be made to blend. There are millions of people in England who would be unable to say *where the moon rises*, and yet these same people have a considerable amount of so-called "knowledge" of astronomy.

Geography and History.

As soon as the Herbartian view is accepted, as soon as we recognise that the main function of education is to unroll before our pupils the pageant of the universe, our *history* will cease to be merely English history. Something will be taught of the great racial movements that have made Europe and the modern world what they are. But the moment such movements are discussed, the influence of geographical facts upon historical will become manifest. Why do white races inhabit the Barbary states and black races the Soudan? Because of the Sahara barrier—the true boundary of "Europe" on the south. What rendered possible the Holy Roman Empire, despite the existence of the Alps? The Brenner Pass. Lines of invasion, directions of commercial activity, and scores of other matters, are guided by geographical conditions. Biblical scholars like Professor George Adam Smith, have shown how historically significant was the geographical position of Palestine midway between the two seats of Oriental civilisation; and how profoundly the work of the prophets and the destinies of the Jews were influenced by this position.

The links between history and geography are therefore obvious. But the links between *literature* and geography have scarcely yet been hinted. There are scores of poems by Rudyard Kipling and Wordsworth which may very well be employed by the teacher to illustrate both places and national conditions. There is the great Portuguese epic, *The Lusiad*, which deals with Vasco da Gama's voyage round the Cape. Still further back there is the Odyssey, with its "Mediterranean" atmosphere. Space would fail if I were to pursue this subject as far as it deserves.

Heuristic Methods.

The only other reform that I need particularly to specify is one that may appropriately be called the "heuristic" (Vol. I., *p.* 112 *et seq.*). "Problems" in geographical arithmetic have already been mentioned. But teachers can go a stage further. In connection with the organised private study which, in years to come, will be a prominent feature of all our teaching, several leading problems, not necessarily arithmetical, but yet involving genuine thought, may be prescribed for purposes of guidance. I am assuming that the teacher has already given a short but vivid lesson, say, upon South America. The pupils are now directed to study South America out of their books ("geographical readers" possibly, or the "source works," which are still more suitable for the present purpose), and are informed that they will be subsequently asked, "Where would you rather live, in Chili or Argentina?"*

Their private reading will now be far more purposeful and effective than if no guiding question were prescribed. In some cases the prescribed question may demand only a few minutes' reading for its solution; in other cases, several weeks may be allowed for the solution of a whole series. I am sure that, despite all our faith in "questioning," we have in times past neglected the most valuable kind of

* There are much more skilful questions than this, but I am suggesting first steps. Another would be: "Where might we expect cotton to be grown if present sources failed?"

questioning—that which conduces to intelligent research. We have either relied on oral questioning, which is often difficult, haphazard, and irritating; or upon written questions of the examination type, which conduce to mere cramming of details. Both of these kinds are no doubt useful in their place, but they are far inferior to "research" questions. Needless to add, our examinations in geography (as in history, and some other subjects) will not always be conducted with all printed matter locked up in the cupboards. Excellent problems for examination could be set by giving travellers' descriptions of an unnamed river, statistics of exports from an unnamed town, etc., and then asking, "Where must such a river or such a town be situated?" In short, the teacher of geography, like the teacher of history, must call to his aid that love of puzzles, of finding out things, etc., which every weekly paper makes use of in its acrostic column, but which the school very rarely uses, except to a limited extent in arithmetic lessons. (F. H. H.)

Map-Reading.

One of the distinguishing features of the modern methods of teaching geography is the prominence given to map-reading. But the old-fashioned maps, politically coloured and with freakish attempts at hill shading, are meeting their well-merited doom, they taught so little. It is true they show hills and mountains, after a fashion. One looks at the political map of Europe, and notices the Alps and the Urals. Little difference can be distinguished between them. An orographical map, on the contrary, shows us that the Urals only in a few places rise above 3,000 feet and that their breadth is great, therefore their rise is gradual—almost inappreciable—consequently they do not form a good natural boundary. The Alps, on the other hand, rise above 10,000 feet and the breadth is small; thus the gradient is steep, especially on the southern side. Similarly, with the maps of N. America.

The old political map shows three ranges of mountains along the west of the States, the Coast Range, Sierra Nevada, and Rocky Mountains, but it does not show that for a breadth of 1,000 miles the land is over 3,000 feet above sea-level, neither does it show us the deep valley behind San Francisco. Again, the political map shows Denver, but the orographical map shows us also that Denver is more than 3,000 feet above sea-level, and that the prairie land has gradually risen from the valley of the Mississippi to that height. Unfortunately, however, different cartographers use different contours as the prominent ones, and different systems of colouring.

Orographical Maps.

The first thing that must be done before a child can use an orographical map is to show what contours are. A wooden model of a hill is useful, especially if it is made of horizontal layers. Clay or plasticine may be moulded into the model of a two-peaked hill, then into valleys, etc.; pieces of thin twine may then be placed to mark the contours, and the model be turned so that the children have a bird's-eye view. The idea once grasped, contoured maps of hills, valleys, lakes, etc., should be placed in the children's hands, and sections drawn across them. Care should be taken that the scale of heights used is not too large, or the heights will be greatly exaggerated. The ideal plan would be to use the same scale for heights as for length, but this is impossible. Squared paper is useful for the making of sections. The attention of the child is drawn to the great incline where the contours are close together, and the gradual slope where the contours are far apart. In some schools clay models can be made on the basis of the orographical map.

Now, what can be learnt from an orographical map? Distance can be measured by using the scale; length of day and night, and to a certain extent temperature can be inferred from the latitude; time from longitude; height above sea-level,

valleys, and lines of least resistance which are generally followed by railways, and have been followed by the movements of men. The Carcassonne Gap has played an important part in the history of France, the Hudson and Mohawk valleys in the history of the United States. If the map has the sea contoured as well, a child can learn something of the bed of the ocean. The 600 feet contour, or the "hundred-fathom line," is exceedingly important. It is probably the real edge of the continent, and the land between the coast and that contour is known as the "continental shelf." As soon as we go within the "hundred-fathom line" we have rocks and sand banks making their appearance, and here we are likely to find edible fish. Seaweeds seem to be necessary for this class of fish, and these plants themselves depend partly upon sunlight, which does not appear to be able to pierce further than 600 feet.

Reasons for the growth and continued existence of towns, and sundry questions of canal construction, are other matters that can be naturally dealt with in connection with orographical maps.

When a child has had lessons on "World" geography he ought also to be able to tell what will be the prevalent wind, and to give some facts about rainfall and vegetation, when provided with an orographical map. But to do this perfectly other maps are required.

Isothermal, etc., Maps.

Isothermal maps will give ideas as to temperature. Three maps are at least required, the annual, and those showing the isothermals for the warmest (July) and the coldest (January) months. Of course the reason for the direction these lines take on entering a land mass will be explained, and a child then obtains one of the distinctions between continental and insular climates. Isobaric maps, in which the winds are also shown, will help a child (together with an orographical map)

to deduce rainfall. The best arrangement would be to have them for every month of the year, but, failing that, the same three referred to above must suffice. Rainfall maps are worthy of study, and should be compared with the orographical and isobaric maps. One cannot leave this section on map reading without mentioning the maps constructed to show the distribution of the population and the origin of raw products.*

The aim of all map reading should be that, if a child comes across a place he does not know, he should be able to tell, by reference to a good atlas, something about its height above sea-level, its climate, its probable products, and the likely occupations of the inhabitants.

The ordnance survey maps (6 ins. to 1 mile) are especially useful in the study of home geography. Every child in the school may well be provided with one of these, and the district may be explored with the map in hand. In a London school one often finds that the map of London becomes the dirtiest, not because the teacher uses it most, but because the children are always discovering places on it when they have a chance.

Map-Making.

Probably the best way to get the pupils to understand fully the symbols used is to let them draw a sketch map of the neighbourhood of their school, or elsewhere, and then compare it with the ordnance map. Should the starting point be the plan of the room (or playground)? If so, the plan-making should be taken with children distinctly older than those who are commonly set to study such things. The exercise is as much one in arithmetic or drawing as in geography proper, and presupposes considerable knowledge of those arts. The walls of the room can be measured, preferably with a tape measure; "pacing" should also be employed, the length of a pace being found by averaging. The corner angles are measured, a scale adopted, and the plan made. The N. and S. line may now be put in,

* Messrs. Black have published a book of *Geographical Diagrams*, which could be used for the above purposes.

and the scale stated in three ways—geometric, 1 inch to 1 foot (or whatever it may be), and the representive fraction. Now the scholar is in a position to attack larger districts, and perhaps all that can be expected of the elementary school is to draw rough sketch maps of districts, using the ordnance survey symbols. North should be kept at the top, and a good exercise is to make the pupils face south and draw the sketch. A firm surface being required for this, a drawing pad will be useful, or a drawing board may have straps attached to it, so that it can be put over the shoulders and form a table in front of the scholars; of course a compass is necessary. If more exact work is required, a plane table and a sighting ruler will be needed. If scholars are practised in drawing rough sketch maps, in a few years' time, when they ask their way, they will not be told to take the first on the right, second on the left, turn round opposite to the theatre, etc., but a rough sketch map will be drawn.

Memory Maps, etc.

Much valuable time has been wasted in drawing the same map over and over again, so that the scholar can produce it from memory when required. The supporters of this practice assert that the children learn just where the places are. This is very doubtful. As a rule they mechanically insert the place, rarely noticing any relationships and positions. Besides this drawback, in some cases the shape is much distorted. The filling-in of blank maps, and the drawing of sketch maps as facts are taught, are much better exercises. The correct shape is always before the child, and he must think before he inserts any name; the combination of ideas is likely to impress the position on his mind. Blank maps can easily be produced in quantities of fifty to sixty by means of the hektograph; if required in larger quantities the cyclostyle can be used.*

* Pin the stencil paper over the map and trace with ink. Then remove the map, and go over with pen, taking care that the cyclostyle is turned so that as many lines as possible may be horizontal, for vertical lines are liable to cut through. If a transparent sheet of celluloid, as sold by the Cyclostyle Co., be placed between the paper and the map no tracing in ink is required.

Isothermal, isobaric, and isohyetal lines can best be taught by giving the children blank maps, and a list of places with their mean annual or mean monthly temperature, pressure, or rainfall, as the case may be, and telling them to place the number against the place on the map and to connect all the places that have certain numbers. If the space between the lines is coloured, the maps are still more effective. The objection raised may be that the scholars will have a number of loose maps, but there is no need for this. A blank drawing book may be used, and the pages filled with blank maps of the region under consideration. Of course this requires work on the part of the teacher, but it is worth it. Two or three lines of latitude and longitude should be put in every map.

The methods adopted in the construction of maps of large districts are not likely ever to be attempted in the elementary school, but to the teacher they are well worth study; children no doubt could be shown how inaccessible distances can be found, even without a theodolite. The width of a stream could be found by the triangular method. A spot where there is a tree on one bank could be taken, and opposite the tree, on the other bank, a stick could be placed in the ground, and the scholar should then walk along the bank until the 45° angle of set-square points to the tree, then, by the solution of triangles, the width could be found.

The various projections used in the construction of maps, and the contortions resulting, repay the attention of the teacher.

Commercial Routes.

The teaching of trade routes would come under the "topical" method, if taken separately, but the best way is to take them when dealing with a country. A child should know not only how to get there, where to start from, the line of steamers, the goods carried away and brought back, but the time the

journey would take, and the probable cost. How winds and currents affect the course of the vessel should also be dealt with.

Commercial routes include not only the great ocean routes, but the great railway routes as well, such as the "Overland," "Orient," and "Transcontinental." In dealing with the railway routes, the control exerted by the orography of the country should be brought out. In the case of our own country, the G.W.R. clings to the Thames and the Kennet valleys, although now that quickness of transport is the desire of everyone, there is the attempt to come to the straight line. The "Orient" route shows the control exerted by surface features. The line follows the Danube valley until Belgrade is reached, there it ascends the Morava to Nisch, where it bifurcates, one line going down the Maritza to Adrianople and Constantinople, whilst the other descends the valley of the Vardar to Salonika.

The routes from England are all important to us, especially those to Scotland, Ireland, and the continent. Children should know it is possible to go by rail to Scotland. When Scotland is taught as a distinct country, some children do not realise that it is a part of Britain. Blank maps are very useful in this work. Time can be written along the routes; the chief goods exported could be put against their respective ports, with an arrow showing the direction in which they go.

Open air geography is coming increasingly to the fore; nature study and open air geography should go hand in hand.

Open Air Geography.

One of the drawbacks to open air work is that it interferes with the time-table, and if it happens to be adopted in a school where the specialist system is in vogue, it causes dislocation of other teachers' work. Expense is the other drawback. Now, a great deal of work can be done within the school precincts. Records of weather (temperature, pressure, wind, rainfall), height

of the sun at noon, length of shadows, diameter of the sun during the year can be made, and from these records curves can be plotted and compared. The part of the sky in which the moon rises can be noted, the altitude of the Pole star, and thus the latitude may be found. (The only apparatus required for this purpose is a stick, piece of paper, and a protractor.) The permeability of rocks, too, could be shown in the playground and, also, how running water wears a course for itself.

The work that is to go on outside the school depends upon its environment. Both in town and country a great deal can be learnt of trees, coniferous, deciduous and evergreen. In the country, and on the edge of towns, hills may be seen, and the child can find out of what they are composed; perhaps at the base there may be softer rocks, and the scholar will see that the hill is there because it is composed of harder rocks. Highgate Hill and Parliament Hill, in North London, exist because the clay is capped with Bagshot sand, which resists weathering more than clay. A river may be near; the children will note how, at a bend, one bank is steep and the other shelving; the material in suspension may be shown, and perhaps a dredger seen; the teacher may thus lead up to the question of the formation of deltas. The river may flood, and the deposition of silt may be seen when the flood has subsided. Springs may be visited at various times, showing how the amount of water depends upon the rainfall. The seaside gives splendid opportunity for observing the effects of the sea on the coasts, the cliffs, etc.

Nearly all towns are on a river; that should be seen, and the vessels on it, what they bring and what they take away, and the reasons can be inferred at school. Generally, the railway runs along the river valley, yet few London boys know that the G.W.R. runs along the valley of the Thames. The town generally stands on both banks, the bridge is an important place, and sometimes has helped to make the town,

as it did in the case of London. Sometimes the origin of place names may be discovered.*

Methods of carrying goods could be observed. In an excursion, the children should observe the following modes of transport:—(1) by rail, (2) by barge drawn by tug, (3) by barge drawn by horse, (4) by boat propelled by oars, (5) by horse and cart, (6) by motor, (7) by electric tram, (8) by man carrying load.

Visits to museums could be included. Products, pictures, relief maps, etc., of other countries may there be seen.

Before all excursions, it is advisable that the children should be told what to look for, and after the excursion the next geography lesson might well be given up to talking over what had been observed. The composition lesson could, with advantage, be given up to writing an account of the journey, or this exercise might be performed at home.

School Museums and Geography.

Children are told that the products of West Africa are palm oil, kola nuts, ground nuts, mahogany, etc., and probably are never shown, and perhaps never told, what these things are, or what they look like. Now, if a portion of the school museum were arranged to show raw materials, ores, and manufactured articles; and if one teacher, an enthusiast for his subject, kept it arranged, the other members of the staff. knowing just where to find an article, would be more likely to use them. If an article cannot be obtained, a picture of it should be exhibited, but educational authorities should certainly provide schools with specimens of the more important raw materials. The method of arranging them depends upon circumstances. One might place together all the products of the temperate region, etc., or, what is better, the ores, cereals, timber, fruit, etc., may be grouped together. Behind these, there might be pinned in the museum cupboard a small map of the world, with the districts from which the raw material

* Taylor's *Names and Places* is an indispensable book for the teacher.

is obtained shaded in red, similar to those at the Zoological Gardens.* Perhaps, too, under the map, curves constructed from statistical returns could be drawn showing the countries from which Britain obtains the majority of her supplies. Children take a keen interest in the formation of a museum, and can often bring interesting specimens.†

Geography and the Lantern.

To make the Geography lessons particularly interesting, and to create vivid impressions, pictures of some kind are necessary. All pictures may be used, from the pictorial post-card to the most expensive photochrome. The drawback to the pictorial post-card is that it can only be seen by one child at a time. This is also the drawback to the stereoscope, but the stereoscope has the advantage of limiting the child's vision, and thus giving greater concentration on the picture; but stereographs are expensive. Probably the best method of illustrating for class purpose is by means of the lantern. The drawbacks to this are:—(1) Expense, (2) difficulties attending its use in daylight, (3) lack of suitable slides, (4) extra labour involved. As regards slides, too, the majority of views have been made to amuse, and have not been constructed from an educational point of view. One can easily obtain slides of Winchester Cathedral, but it is a difficult matter to obtain a slide which shows rocks scratched by glacial action. As time progresses, better slides no doubt will be produced; if the teacher is a photographer, he will be able to make his own. Maps and diagrammatic slides are useful, and these anyone can prepare.‡

There is no need to have a perfectly dark room in which to

* Small Museum Maps can be obtained from Messrs. Stanford, Long Acre, W.C., or, to save expense, could be hektographed.

† Teachers wishing to obtain specimen products, or photographs, from other countries, should communicate with Secretary of the League of Empire, Caxton Hall, Westminster, who will advise them what to do.

‡ All that is required is negative varnish and ground-glass slips 3¼" × 3¼". The latter can be obtained from any glass cutters. The slip is placed on map or diagram, and the map traced with a hard pencil. Two coats of varnish are given it. The slide is then ready for use.

work a lantern. Blinds made of dark material should be fitted to the windows to prevent direct sun rays falling in the way, and enough light may be left to enable the pupils to draw sketch maps and take notes, if necessary.

The amount of extra labour depends upon the kind of lantern used. But no doubt before long some of our best Elementary Schools will be provided with a geographical lecture room, just as they have their chemical and physical laboratories. When the importance and educational value of geography are fully appreciated, there is every reason to believe that money will be spent to improve its teaching. The lecture room would be fitted with electric arc lanterns, dark blinds, museum cupboards round the walls, drawers to store maps, a reference library, etc.; and then the extra labour will be practically nil. (J. W. P.)

CHAPTER VIII.

Natural Science.

I.
GENERAL PRINCIPLES.

During the Middle Ages astronomy had a recognised place in education; but though, in the sixteenth century, interest in science became intense among many people, this interest was on the whole eclipsed by that in the classical languages, with the result that until the nineteenth century few schools ever attempted any systematic teaching of the subject. Yet there had been a number of "realists" in education even in the sixteenth and seventeenth centuries; but some of them were "verbal realists"—advocates of the teaching of science by means of books, instead of by means of actual observation and experiment. Rousseau's half-sincere, half-theatrical attacks on bookish education were influential with Pestalozzi and Fröbel; Herbart, as I have pointed out, regarded Nature and Humanity as the two main branches of the tree of Interest; and at last Spencer appeared, and the argument for science teaching was set forth in a way that convinced. Of recent years the British Association has been active in urging the claims of the subject, and Professor Armstrong has set forth in considerable detail what he believes to be the best methods of teaching it.

History of Science Teaching.

Yet there is some doubt whether either the older methods or those advocated by the British Association reformers are altogether sound. The reason for this doubt is that the

notion of "faculty training" or "formal training" seems too predominant.

The "Faculty" Psychology.

Two "faculties"—"observation" and "reasoning"—are supposed to be specially developed by this subject. "Object lessons" took more particular account of the former faculty; while systematic chemistry and physics took more particular account of the latter. "Boys must be taught to 'observe'; boys must be taught to 'reason,' to 'think for themselves'"; these were the exhortations freely and vigorously uttered by advocates of science teaching. Some, with more particular concern for the second of these "faculties," urged that a "fourth R"—Reasoning—should be added to the existent "3 R's."

More recently, another "faculty" has received a large and flattering share of attention. This is "accuracy" or "exactness." To call it a "faculty" may sound strange to the reader, but it has just as much and just as little right to the name as "observation" and "reasoning." Experimental science, in the opinion of these advocates, will cultivate habits of "accuracy" in weighing, measuring, and so forth; these habits, once acquired, will be transferable (we are confidently told) to other affairs of life, such as cooking food or keeping ledgers, just as habits of observation and reasoning are alleged to be transferable. When all these "faculties" are thoroughly trained, Britain will have a chance of beating her commercial and industrial rivals, and the millenium itself (under British patronage and management) will be not far off.

Doubts and Difficulties.

Yet somehow the thing has not worked so smoothly or successfully as was hoped; and, indeed, when we hear from one source that "observation is the grave of thought (*i.e.*, of reasoning)," and from another that many of the greatest scientists have been "inaccurate" outside their own department, we begin to suspect that there is something wrong, or at least superficial, about our ideas of the purpose of science teaching.

A promising step forward was taken when infant schools began to develop schemes of "nature study." The "faculty" dogmas were here largely dropped, and more fruitful concepts, Fröbelian and Herbartian, took their place. The stress was now laid on "interest" and "self-activity"; garden peas were not to be analysed into qualities like "opacity" and "rotundity" (in the old "object lesson" fashion), but they were planted, and their growth watched; spawn developed to tadpoles, and tadpoles to frogs, under the eyes of the pupils; poetry, story, motto, drawing, modelling, were linked on; in fact, a genuine and comprehensive attempt was made to give a first hand, a living, an æsthetic "presentation of the universe." Broadly, it may be said that "nature study" in good infant schools is the best form of science teaching at present in existence. Yet the moment the pupil migrates to the senior department, he reverts to the "object lesson" method; and the punishment book begins to tell the tale of "persistent inattention" during the very lesson supposed to cultivate attention or observation.

Nature Study.

No better example could be given of how educational "theory" affects "practice" than this. The empirical teacher who discounts "theorists," is himself a theorist; he believes in the "faculty doctrine," and the doctrine in his hands is by no means a success. Between his dreary "object lesson" and the "nature study" lesson of a good infants' school there yawns half a century of progress. And that progress, we must admit, is mainly due to Fröbel.

Yet Herbartian are sometimes more illuminating than Fröbelian formulæ. "Self activity" is, no doubt, a more helpful phrase than the arid phrases of the "faculty" psychology, but "apperceptive interest" is more helpful still. "Observation," "reasoning," "accuracy," are rooted in ideas and interests. We "observe," we "reason" about, we are "accurate" over, things that we feel an interest in, things whose significance we apperceive. Often and often the five-

year old child applied these three qualities to his "nature study"; the seven-year old child, transferred to the senior school, applied none of them to his "object lesson" on chalk, or leather, or wood. As to genuine "observation"—obviously, the boy who works with wood in the manual training room learns to "observe" it—unless, of course, manual training fails to keep in sight true educational ideals.

Armstrong v. Hall.

On the whole I feel somewhat uncertain whether teachers of science should array themselves under the banner of Professor Armstrong or under that of Dr. Stanley Hall. As I showed in the first volume of this series (*pp.* 3-4), while the former is urging the necessity for great "exactness" (=accuracy) and for a "heuristic" and logical course of procedure, the latter is urging the claims of "popular science"—"great wholes, facts in profusion, but few formulæ." Yet Professor Armstrong, if I understand him aright, is not blind to the value of the more imaginative side of science work; I doubt whether he would exclude from the school the biographies of great discoverers; and if those are admitted, popular science, too, is admitted. On the whole, I question whether, outside the realm of practical measurements (most conveniently regarded as part of mathematics), there is much room *in the elementary school* for scientific "accuracy" or "exactness" as a quality to be cultivated *for its own sake*. I believe that with the cultivation of apperceptive interest we shall cultivate as much "accuracy" and also as much "reasoning" and "observation" as are necessary or desirable. The moment the scientist (or the pupil) is *in earnest* with a problem or experiment, at that moment he sees the necessity for accuracy and exactness. These qualities are not good in themselves; in many concerns of life they are the weapons of the positively bad man. Forgers, for example, have to be very "accurate," and burglars very "observant." Moreover, the spirit of observation, research, and exactness, upon which Professor Armstrong lays such stress,

can be encouraged not only in the science lessons but in all lessons;* the danger is that we may encourage it to work in a vacuum; that instead of setting our pupils in the way of making such observations, solving such problems, or measuring such quantities as suggest themselves in the course of copious studies, we plan out a scheme of "research" in which no real interest is taken.

Before leaving to my collaborators the treatment of the chief "subjects" commonly included under Natural Science, I would deal briefly with some that are comparatively neglected.

II.

PHYSIOLOGY AND HYGIENE.

Physiology—Lack of Success.

Physiology is rarely a successful school subject. Instead of a sense of the wonder and interest of the human organism being produced by our school lessons, the body has been reduced to the level of the commonplace, if not of the ignoble. Somehow, our pupils do not feel that the "venæ cavæ," or the "lumbar vertebræ," or even the "acetabulum," are fascinating subjects. Presumably, they ought to feel it; but they do not.

Some of the reasons for this failure are obvious.

Physiology lessons, more perhaps than any other lessons on science, have tended to be a series of purely technical, assertive, and even dogmatic statements, "illustrated"—if the expression is not absurd—by diagrams of a more or less misleading nature. The criticism commonly directed against modern education, that it is a process of "cramming with facts," is here justified in an unusually emphatic way. I need scarcely repeat that the giving of *genuine* facts, *genuine* knowledge, is an essential part of education; but the giving of what is really fictitious knowledge (not knowledge at

* "The classics" in secondary schools are often defended on exactly the same grounds; they are alleged to afford an excellent "gymnastic of the mind," cultivating exactness, etc.

all)—in other words, the proclamation of certain verbal statements, such as that there are four chambers in the heart—is comparatively unimportant, and in many cases verges on the dishonest and the pernicious. A verbal scaffolding is sometimes unobjectionable, provided it surrounds a certain amount of genuine and living knowledge, but when *everything* is verbal scaffolding, the subject is in a parlous state. In these days, when much of the "dogmatic" religious instruction of our schools is being freely, and often rightly, criticised, the teacher will do well to remember that modern attempts at teaching physiology, and sometimes even hygiene, are often ultra-dogmatic, and afford no encouragement to "reasoning," "observation," or any other "faculty."

I have here, however, space for only a few suggestions for improvement. I would urge, first, that unless physiology is illustrated by actual physiological material, it cannot be taught satisfactorily at all. A sheep's heart is easily procurable, but rarely procured, with the result that the enormous thickness of the ventricles, the insignificance of the auricles, and similar matters, are unknown to children, whose only acquaintance with the "heart" is made through a diagram resembling a shield, with an inscribed cross of St. George. Unless actual material is used—a dead rabbit, "lights," heart, or brain—the subject should not be attempted, except in the historical form presently to be mentioned. A scientific subject distinguished from most others by the accessibility of its material, should not have to go begging for it when every butcher's shop provides abundance.

Use of Material.

Another plan is to keep physiology close to hygiene, and *to keep hygiene close to life*. This last advice seems at first gratuitous, for what is hygiene if it is not close to life? Yet pedantry—the recurrent bane of education—is often as noticeable in this subject as in any other. Things are taught because they are found

Hygiene must be Hygiene.

in some text-book, dealing, perhaps, with conditions widely different from those of the scholars. Children in towns, where the water supply is looked after on a large scale, are taught the various *methods of wholesale filtration*. The hapless poor, whose power of choice over their dwelling-place is limited by the number of shillings they can pay for the one or two rooms into which a whole family has to be crowded, are told about Sheringham's valves and Tobin's tubes! By all means teach about filtration and ventilation; but if hygiene is the theme, let it start (though not necessarily finish) *close to the life of the scholars*. The teacher should ascertain, with all necessary delicacy and tact, the kind of meals (generally there are no "meals" at all among the poor), the hours of sleep (many children are dull and incapable owing to late hours), and the conditions of life generally among his pupils, and with these conditions constantly in his mind, should resolve to give the best possible hygienic advice—backed up by such science as is available. In a generation or two this will doubtless produce some effect upon our national life; if the teaching of hygiene has hitherto accomplished little, the reason is largely that the subject has been academic and unpractical. Elementary "first aid" would also be excellent, as appealing to the motor activities of the child.

The Romance of the Microbe.

A third plan, possibly suitable for upper classes, is that of *starting with the romance of the microbe!* But here (again) there is danger—the danger of reducing even the microbe to the level of the common-place. It is our business to try to preserve, as the author of *Let Youth But Know* rightly urges, the "faculty of wonder" in the young; but to do this we must, as teachers, ourselves feel the wonder and stupendousness of the great panorama which, since the hour when Leeuwenhoek first saw the microbe through his humble microscope, has gradually unrolled itself before the vision of mankind. We are now learning how nations have risen and

fallen through the agency of the bacteria of consumption, or yellow fever, and so forth; how shores have been defended from invasion, and continents secured as the monopoly of a race, by the smallest of living creatures. Whoever has read Mr. Wells's *War of the Worlds* will remember that bacteria brought to an end the supposed invasion of our earth by the Martians; and whoever has read books like Dr. Archdall Reid's *Principles of Heredity* or Dr. Macfie's *Romance of Medicine*, will find that in this subject, reality is as interesting as scientific fiction. I am tolerably sure that by starting from the story of the ubiquitous microbe, the teacher of a senior class could teach physiology and hygiene in a way that could be fascinating to all his pupils. Only he would need a little of what is commonly called imagination, but what is really much the same as rich and vivid knowledge.

There is perhaps a still better mode of approach. No doubt the time will come when our schemes of moral instruction (or of history) will make adequate provision for teaching the biographies of the great pioneers in the various arts and sciences; at present only one art—that of war—receives any attention, with the result that while the names of commonplace generals are familiar to our scholars, the names of great scientists, discoverers, architects, and the like are unknown. Such a thing is a disgrace to our civilisation. I suggest that the teaching of physiology, so far as such teaching is possible within the limits of primary education, may very well take a biographical form. Every fact of genuinely hygienic importance could probably thus be taught—and taught in an intensely interesting manner.

Use of Biographies.

Think of two of the founders of modern physiology, Vesalius and Servetus. How short their lives were! The one (fortunately death cut him off prematurely) was a victim of Catholic intolerance (for dissection had been proclaimed for centuries to be "sacrilege"), the other was a victim of the Protestant intoler-

ance of Calvin. Think of the greatest physiologist of all, our own Harvey,* reading a book sedately while the bullets of Edgehill battle fell near him and the two princes, afterwards Charles II. and James II., who were entrusted to his care. And what teacher is there, possessing the requisite knowledge, who could not arouse expectation by showing how Harvey was compelled to leave one gap in his great hypothesis, and how, a very few years afterwards, Malpighi's discovery of the capillaries completed Harvey's work? Are there not here all the elements of suspense and climax, all the elements of *interest*? How infinitely better, how infinitely more humanising, than the common dogmatic teaching!

Then there is the cell theory, elaborated through the labours of Schwann, Virchow, and many others; there is the microbe theory, already referred to; and there is the culminating romance of Metchnikoff's white blood corpuscles. Any teacher who is unable to make these themes interesting, especially this last theme, the warfare between the microbe and the phagocyte, must be poorly equipped in mind and soul. The invention of antiseptic and aseptic surgery, the discovery of anæsthetics, the tracking down of sundry tropical and other diseases, are themes which abound in heroic incident, and will some day, I doubt not, find their place in our schemes of moral, historical and physiological instruction. The time will come when names like Harvey and Metchnikoff will be at least as familiar as names of second-rate generals or even first-rate footballers. Silently the whole realm of religious and social life has been revolutionised by medical discoveries: in place of devils and witches we see microbes; and instead of employing shrines and incantations we employ antiseptic surgery. The men who have accomplished these things deserve some recognition from the race they have benefited.

* Harvey's book on the circulation of the blood is now conveniently issued in *Everyman's Library*. No teacher who talks about "the heart" to his class should be without it.

To sum up. More stress on the historic and humanistic side of the subject; a more incidental treatment of the naturalistic side; the linking on of the hygiene of cleanliness, etc., to modern views of bacteriology; the use of at least a *little* first hand dissecting material in preference to diagrams—the latter being employed more to answer the questions that will suggest themselves, than to provide texts for disquisitions; in short, a more romantic, living, suggestive, arrestive treatment generally, with more notes of exclamation and interrogation than at present—these things will help to save the subject of physiology and hygiene from scholastic degradation.

III.

ASTRONOMY.

Another subject which is either not taught at all, or taught upon entirely wrong principles, is that of astronomy. Here again—except in the infant school, where occasionally the element of wonder* and romance is preserved—dogmatism reigns supreme. The text-book is almighty. Definitions of planet, ecliptic, and the like; misleading diagrams of the "solar system"; occasionally impromptu illustrations of day and night or of the seasons, by means of lamp and globe; these constitute the substance of the astronomy we teach. No doubt there is a place for these things, though I question whether that place is the primary school; their general tendency is to destroy the romance of a most romantic subject. The child who has "learnt" about the solar system in this way, acquires a jaded taste; the wonder of the universe vanishes; there is nothing more to learn. And yet all the time his "knowledge" may be thin, fictitious, or positively wrong!

Astronomy—Lack of Success.

---

* Jane Taylor knew something of the child mind when she composed:

"Twinkle, twinkle little star,
How I *wonder* what you are."

Such astronomy as can be taught at all must be largely taught from the heavens themselves. Our pupils must be encouraged to note where the sun rises, where the moon rises, how the moon moves in the ecliptic relatively to any planets that may be visible; and the leading constellations should be known. Schools do not meet at night time, but that is no obstacle to work of this kind being carried on. A few lessons a year —or rather, a few "talks"—are quite enough to awaken interest; and then, perhaps, in the upper classes of the school, apparatus and diagrams may at last be produced, and the pupil be taken behind the scenes of the universe. But, on the whole, I question whether the elementary school should do much beyond cultivating a naïve, observational, wondering attitude. Books like *The Stars in Song and Legend** will provide the teacher with material for the romantic part of his work.

Astronomy at First Hand.

Epoch-making events, like the invention of the telescope (to be paralleled by the teacher with the invention of the microscope, which opened up the great field of bacteriology): biographies like that of Galileo; great predictions, like that of the existence of the planet Neptune (to be compared with the prediction, or, at any rate, assumption, of capillary circulation, by Harvey); these, and similar matters, may very well form the staple of such astronomical teaching as we attempt with our upper classes. Now and then an imaginative touch from works like those of Mr. H. G. Wells (*The War of the Worlds*, *The First Men in the Moon*, etc.) may help to preserve or heighten the romance of the subject. And as for teaching the mathematics of "the seasons"†—well, in primary schools there are difficulties in the way of any over-systematic treatment. Possibly, the best moment for dealing with the

Historical Method.

* Ginn & Co.

† We could, in secondary schools, approach the subject from the facts of the Great Ice Age.

cause (as distinct from the significance and the effects) of the seasons would be when the geography of polar or tropical regions brought the class face to face with unfamiliar facts about sun or climate (the "midnight sun," etc.). I doubt whether such a theme as this should be sprung on a class without a prior interest, practical, historical, or other, being aroused. So also with the tides—a still more difficult subject.

Interest above all.

Emerson says in one of his works: "If the stars came out only once in a thousand years, how men would wonder and adore, and preserve for countless generations the memory of the City of God they had seen." It is this spirit which must, at all costs, be awakened and preserved if astronomy is to be taught at all in our schools. I doubt the possibility of preserving it, if we aim at "thoroughness" in the sense of text-book explanations, and the matter may be summed up thus: Any facts that are interesting, stimulating, romantic, wonderful, curious, you may legitimately deal with, but do not be logical, systematic, exhaustive, or "scientific," unless there is a clear reason for being so, but rather point to sundry sources of information, where the pupil can find fuller answers to his questions; drop hints innumerable about possible beings on Mars or Venus; be expansive, imaginative, audacious; be as historical and biographical as you choose; and, above all, *know your subject.* In most cases the dull teacher is the ignorant teacher.

IV.

GEOLOGY AND METEOROLOGY.

I AM now approaching the borderland of "Nature Study" in the new and narrower sense, but there are sundry and miscellaneous subjects for the detailed study of which the elementary school has no time, but which must in duty receive many a chance elucidation, many a hint that may awaken or create an apperceptive interest.

I commented above on the dangers, along with the occasional value and necessity, of a "verbal scaffolding' of knowledge, a systematic and scientific outline of a subject. On the whole, the danger is greater than the value. It is so easy to "teach" a child a catechism, or a genealogical tree, or a list of planets or species—it is so easy for teachers, inspectors, and examiners to teach, inspect, or examine purely "verbal" knowledge—that one of the chief duties of the present-day educationist should be to set himself against outlines and systems and scaffoldings. But now and then the value of these things becomes manifest. Whoever can recite the list of Roman emperors from Augustus to Marcus Aurelius does possess an equipment which is occasionally useful. And I am certain that one piece of verbal scaffolding is badly needed by the modern Englishman—a list of the great geological systems.

Geological Systems.

Standing on the soft Tertiaries of Bournemouth, he knows nothing whatever about them; whether they were formed before or after the red rocks and limestones of Torquay, or the chalk of Brighton, or the clay of Southend, or the sandstone of Hastings, are matters beyond the circle of his interests. Now England contains every geological system; it is an epitome of a hundred million years of earth-history; it is the best natural museum in the world. An intelligent youth possessing an interest in geology, and living anywhere else in the world than in England, has every right to curse his fate. I urge again, therefore (see *p.* 113), that though there is no room for geology on our time-tables, an occasional lesson on the subject should be forthcoming. I think that, after our pupils have seen a few cliffs or railway cuttings, the teacher may very well give a list of the geological systems, and show the place of the aforesaid cliffs or cuttings in the series. Such sea-side (or similar) places as the pupils are known to visit may be more particularly referred to. Without reference to the carboniferous and other epochs, our lessons on "coal" are farcical.

Weather Mysteries.

The reputation of the winds for lawlessness* is being undermined; nevertheless, meteorology is not yet a perfect science, and for that very reason it provides good material for school work; it affords little chance for dogmatism. A minute or two may daily be devoted to recording weather conditions; and when meteorological mysteries occur (such as the "cold period" about May 10th) the teacher may seize the opportunity to emphasise how little meteorology we yet know. I feel sure that there is need of such emphasis; and that, for example, instead of "explaining" the fall of bodies by attributing it to the "force of gravitation," and thus deceiving ourselves and our pupils by our verbal presumptions, we should at almost every point be emphasising the wonder and mystery of things. If we wish to be dogmatic, let us dogmatise over the greatness of Harvey, Newton, Darwin, but not over some verbal generalisation whose place is rather the college than the school. (F. H. H.)

V.

"NATURE STUDY."

Introductory.

THE school of to-day, in its curriculum, offers considerable contrast with older systems, sometimes suggesting progress towards an educational ideal, sometimes the reverse. Where commerce and business and mere utility rule, school tends to be non-educational, and need not be considered in this chapter.

But the introduction of various forms of Nature Study into both primary and secondary schools, and into colleges, may be taken as an expression of the same movement which speaks out earlier in the poetry of Wordsworth and Tennyson, and in the paintings of Constable and his school.

* John iii. 4.

Poet and painter gave their best, with the utmost truth, to nature, and were no longer content to work in classic pattern and conventional style, as others had been before them. These revolutionists are selected merely as types of a long line of poets and painters whose works signified, first of all, an endeavour to *see Nature as she really is*, whether in the garb of the human mind, or as displayed in a beautiful landscape. Such a "return to nature," to "inquiry," and "investigation," is in reality an evidence of life and vigour, and carries with it a feeling for the open air, as against the studio life, and for the experiences without which Richard Jefferies' works could never have been written.

"Nature" Revival.

School life has awakened in response to the same influences. The old order is changing, slowly but surely, in regard to the subject here treated. In a little time, opinion, literature, opportunity, will make headway, and every school, it is hoped, will revise its "science" curriculum, expanding it to include natural phenomena of many kinds, and selecting for inquiry and study such material as lies nearest to the life and experience of the child.

The facilities offered by educational bodies for school journeys and "outdoor" work should encourage the fullest possible expansion of schemes of lessons, both in town and country.

"Rambling clubs" and "naturalist societies" offer an admirable opportunity for continuation of the work done in the class-room. Many schools have organised such clubs for Saturdays, and evening outings for ordinary day scholars, with much success.

"Outings."

A chapter might well be devoted to the literature of "Nature Study," which has now grown into importance. In addition to the great classics of Darwin, Lubbock (Lord Avebury), Huxley, Lyell, Geikie, Ball, Tyndall, and others, current literature

Nature Study Works.

includes numerous periodical and innumerable illustrated text-books and chatty nature books of ever increasing variety and interest. Publishers vie with each other in producing useful volumes dealing with "pond life," "birds," "the seashore," in fact, with most branches of Nature History, and an admirable selection is at hand from which to choose either text or class books. The first of the older classics, White's *Selborne*, appears once again fully edited by no less an authority than Professor L. C. Miall, whose works on "aquatic insects" and the "harlequin fly" commend themselves to all inquirers. (*See* Appendix of Books, "Nature Study.")

Modern Naturalists.

The coming of Nature Study into the schools needs no apology or justification at this date. The interests in Nature's work fostered and promulgated by such profound inquirers after scientific truth as Charles Darwin, Alfred Russell Wallace, Bates, Owen, Huxley, Romanes, Mivart, Lord Avebury, and a host of other earnest workers in life studies and natural history inseparably connected with the "proper study of mankind," are now, thanks to the naturalists named, becoming interests to all. *The Voyage of the Beagle* has long been a popular work; the *Origin of Species* may be had at a popular price at any bookstall; and the greatest naturalist of the century, with his co-workers, has opened up stores of "earth" knowledge and "life" knowledge of the highest educational value in the schools, because so many of the truths ascertained concern *familiar* things hitherto overlooked, and as accessible to the young student as they are in themselves fit for child study.

In much scientific teaching hitherto, and even under the best working conditions, this element of "fitness" has been sadly overlooked. Excellent laboratories and enthusiastic teachers have been provided, but too much attention has been given to highly specialised work. Thus "Nature Study" bids

fair to select from each of many branches of science what is most suitable (because most interesting) for school life and inquiry, and to use laboratories in the interests of a general scheme of practical work in hygiene, botany, zoology, etc., as conditions allow.

In such general schemes, "*breadth*" of knowledge, and sustained and permanent interest are the aims. The "science" lesson should surely be a guide to deeper interest in after life, and this "observation" carried on in and out of school, should lead to those intellectual and refined "pleasures of life," about which Lord Avebury has written so sincerely and charmingly. The same author's *Beauties of Nature* expresses again and again the value to man, under all circumstances of life, of such a training as the study of nature gives. As one reads and realises, it becomes more and more a matter of wonder that all that lives and moves, and passes with us daily should so long have been of little interest, and that boys and girls should have passed out of the schools often really untrained, unobservant, *looking without seeing*. "Chemistry" and "physics," too often remote, lifeless studies for average children, can never rouse the sense of interested attention so easily elicited and immediately observable where more congenial studies are adopted.

Ultimate Aims.

Nature study in the town school should prove as great a delight as it is a necessity. School journeys are, however, often difficult to make, in regard to distance and expense, but on neither ground impossible, if the enthusiasm for the subject is equal to its needs. Much has been done in some of the poorest schools in large towns. Be it said that "town" children, least familiar with direct nature, invariably display the greatest interest and attention in matters of nature study. To the country child all such things are as familiar as his speech; interest is the more difficult to arouse, and a certain

Town and Country.

indifference, where "life" is concerned, has to be overcome. A good start is often made, however, by collecting and classifying, by hunting up peculiar and uncommon plants, and by rearing, scientifically and carefully, young animals. Many farmers and agriculturists have benefited by the schools assisting in the investigation of insect pests—their life histories, prevention, etc, on the lines laid down by the late Miss Ormerod. School gardens are an attractive feature of study in another direction, and agricultural chemistry is often made the subject of practical work.

In the interest of the child, then, and in regard to his future life, it would seem imperative that, suitably to his years, he should be encouraged from his earliest time in school to notice natural objects intelligently. In the junior and the senior schools, much may thus be done from a purely educational point of view, to assist the child mind gradually to see and understand much of the whole of which itself is a very small part, and by degrees to understand something of its responsibilities and of the balance of life in the world in which it is to live.

Range of Subject.

The general scope of nature study and its relationship with the Sciences needs consideration. Whether studies laid down in biology, botany, physiology, etc., assume an aspect of Nature Study will depend upon the "point of view" and "method" adopted by the director and student. That course would seem to be best, and of the greatest general interest, where highly specialised work is unattempted and where it is sought only to elucidate such broad general principles as govern life and development in nature. The greatest result of all such training is the power to see, reflect, and conclude, as natural phenomena are presented to the observation. Only intelligent perception is of value, and, if this be stimulated and encouraged to work as broadly and comprehensively as possible, no better training can be given.

Comparative Method.

For the Nature student in general, simple outlines embracing a wide field of observation will mean more than any subject pursued in detail and minutely dissected. The function of "respiration," for instance, offers zoologically a wide range of interest, and as an item of Nature Study would include all manifestations of itself in "aquatic" and "terrestrial" forms. The breathing of insects at different stages of metamorphosis, of fishes, of amphibia, of mammals, evolved in response to environment and life conditions, never fails to deeply interest the student when presented as varyingly characteristic of different organisms.

Similarly, the study of an ordinary "smooth newt" and its life history invites comparison with all other species and with allied amphibians as modifications of parts are noted. The observation of such divergences as arise in the same group, or between allied groups, necessarily promotes interest, attention and reflection, often productive of further interest and research later on.

Such methods of observation and comparison convince the student that as "no man liveth to himself," so all that is in Nature is acted upon by and reacts upon associated things. Modern methods of teaching geography and history make it plain that the subjects cannot be dissociated, and also that the geography and history of a country can only be satisfactorily made out where such relationship is constantly in view. On such a principle the "nature" student has ever before him correspondence to some type, divergence and variation from it, and conclusions arising from observation of the same.

But in and out of school, whatever special facilities and opportunities may exist, beyond all question the most interesting and valuable of all nature studies is that of *life* and *living things*. Just as the problem of life itself has exercised the mind ever, so the functions of life, the observation of life manifested under ever varying conditions, from the

simplest and most obvious phenomena with which we are face to face daily, to the highest and most complex studies now attainable by microscopic research in biological science, all are in degree of absorbing interest to child and man to-day.

With most, the love of animals and plants is an instinct from the earliest years. Hence, the infants' school of to-day is not only equipped with animal toys, models, pictures, etc., but small animals are kept and reared in school, and an interest is created in the very first stages of life. Chats with the children over these school pets must inevitably lead to keen humanitarian interest and early scientific knowledge derived from the daily management of the animals. In many infants' schools the "rabbit-hutch" now proves a valuable first step in Nature Study. The management of these always favourite animals is carried out by the children, and in such pleasant first experiences much good is done. Infants' schools should possess aquaria containing simple animal and plant life in well-balanced proportion and illustrating forms of life in water. Plants grown in water, or in earth or damp sawdust (bulbs, etc.) and suggesting first ideas of growth (wheat, horsechestnut, acorn, potato, bulbs, etc.) will lend an intelligent brightness to the school life and will help, with other nature studies and suggestions, to outline at an early date in child life a simple series of observations, to form the basis of deeper scientific inquiry at a later date in the senior school.

School Pets.

At this "infant" stage and at different periods of the year there should be no lack of lesson material for sight and handling in the schoolroom. The seasons of leaf and flowers, of fruit and seed, offer material in endless variety in the country, and to a less degree in town, throughout the year. Simple first lessons in colour, form, growth, structure, are perhaps more naturally associated with plant life at different seasons than with anything else. Such material, too, is usually easily obtainable, and may be utilised for drawing purposes, in one or more of its many forms. Children themselves are well

pleased to bring material for lessons as they find opportunity, and their interest is stimulated and encouraged thereby. The museum in the infants' school, as in other departments, may increase as this subject grows, and may worthily express in the simple and homely nature of its contents the aim to put Nature in its simplest and most obvious ways before the children. It will suffice if in the infants' school an attempt is made to arouse interest in Nature by directing and assisting simple observation, leaving the future educational life to stir more deeply towards inquiry and reflection, as reason and understanding mature. The dissection of dead insect parts (cockroaches, beetles, etc.) sometimes practised in infant schools at this immature age, has a bad tendency and cannot be sufficiently condemned. Dissection at the hands of the very young is too much like destruction and should find no place in infant school lessons.

At the present time there are already published a few excellent picture reading books, suitable for young Nature readers and well calculated to give a pictorial and literary interest to the subject. Such primers form an easy introduction to the Nature readers of the upper school. These latter readers may be known as Science Readers, Nature Readers, Object Lesson Readers, etc., but in all schools where a scheme of Nature Study lessons exists, a reader which as far as possible coincides with the syllabus of work attempted, might supplement the usual literary and historical readers. A list is appended of a few such books, at once literary and scientific, that the writer has found of great value.

The child who has been helped to see things as a *whole* in the infant and junior schools will probably, as his faculties ripen, see more and still more in the same thing. An impression has been made, dormant perception is aroused, inquiry stimulated, and, perhaps, some particular "bent" discerned. "Looking" has resulted in "seeing," dimly, of course, and in part, at first, but still seeing. There is consciousness of much to be seen and known, and a feeling of keen

interest and pleasure in the new sensation. The desire of "discovery" has been born, and, being fostered judiciously, may quite possibly wrest from nature other of her secrets in the future.

It is the purpose of Nature Study to discover interest in life, and to help children to "apperceive," to see many things with the eye and mind hitherto unseen and with such vision to reflect and proceed. If in child life Nature Study makes something of this possible—and it does—by way of inducing thought, attention, interest, enthusiasm, if we derive an expansion of view and more and more certain knowledge and wisdom concerning those things of the universe about which, by reason of defective education, comparatively few are concerned at all, a greater work has been done in the schools than has ever before been accomplished. The ethical value of such opportunity is immense, and such studies as may be expected to engender humility and reverence, must produce in the man, principle and character of a very high order indeed. The boy naturalist, as a rule, continues his studies as a man, probably filling his leisure with further developments, and, perhaps, research along the line of thought first brought home to him at school.

Schemes.

It has already been stated that the schemes of lessons in practical work will vary as conditions either of place or personal interest necessitate. And, although within the limits of this article it is obviously impossible to do more than outline the various issues of the subject and its possibilities, it may be helpful to refer to one instance of work done in a very poor school in "town," some miles from park or suburb. The scheme of lessons drawn up for the use of each class embraced the following:—

Object Lessons. Outdoor Lessons.
Drawing and Painting from Nature.
Microscopic Drawing from Slides.
Reading (Science). Lantern Lessons.

1. Lists of lessons will be found at end.

2. Outdoor lessons consisted of excursions, of twelve to twenty boys with the master, to Kew Gardens, Hampstead, and Museums, etc., to note—

Trees:—Growth, bark, leaves, size, character.

Peculiar plants:—Pitcher, sundew, fly-trap, etc.

Alpine plants and their character.

Economic plants and their uses.

Pond life:—Fish, weed, frogs, etc.

The Thames at Kew:—Observations were made in respect of wind and sun, the sun's time and shadow, earth slope, drainage, character of soils, denudation, river valley and tide.

Obtained:—Wild flowers, fir cones, stickleback, pond-weed.

Essays on the route, direction, gardens, points of interest, return, were corrected and kept.

3. *Drawing and Painting.*

(Tues.) Class I. Two hours a week drawing and colouring from Nature-leaves, flowers, etc.

(Wed.) Class II. Two hours a week drawing and colouring from Nature.

An art teacher visited and taught as above, the children drawing from specimens freshly obtained and in sufficient numbers for every boy to have a specimen. Many such drawings were framed and hung permanently in school.

4. Boys in Class I. were taught to use a large microscope, and drew typical objects at sight, enlarging the same to apparent size. (Insect parts, plant stomata, structure, etc.)

5. *Readers*, graduated to meet class requirements, were placed in each class. (Authors: W. Furneaux, Theo. Wood, A. E. Buckley, L. C. Miall,)

6. *Occasionally* lantern slides covering a part of the syllabus were shown to scholars, illustrating insect parts and various special points of lessons.

PRACTICAL WORK.

1. The study of an aquarium and the stocking of the same, including the following:—

(*a*) Weed established to aërate water (American water weed or other).

(*b*) Gravel and well-washed sand.

(*c*) *Golden carp*, *beetles*, (*dytiscus*, or *hydrophilus*), *stickleback*, *tadpoles*, *water snails*, *newts* (kept separately and not overcrowded).

(*d*) Aquaria with larvæ of dragon fly, ephemera, caddis, to follow life history.

(*e*) Aquaria (miscellaneous): microscopic objects, rotifera, cyclops, daphnia, vorticella, melicerta, frog and toad spawn.

2. *Dragon Fly Larvæ*: fed for two or three months in glass gas jar during aquatic stage.

Observed—breathing from rectum; voracious habit, and deadly mask (jaw) in action; metamorphosis to "fly" stage (observed throughout).

3. *Caddis' cases* of various pattern, species of caddis, structure, use, feeding of caddis, processes of metamorphosis.

4. *Pond hunting* for above specimens and water snails, water spiders, spawn, rotifera, water plants.

5. *Flower dissection* of certain types, with special reference to methods of cross fertilisation—violet, primrose, nasturtium (use of needles, one inch focus pocket lenses).

6. Growth of bulbs in hyacinth glasses or large, shallow, terra-cotta pans.

7. Seedling scarlet runners, beans, etc., in window boxes.

8. Window plants, geranium, fuchsia, nasturtium, etc.

9. Drying and pressing of typical leaves and shoots to be used as "drawing copies" when living material not available.

10. Examination of blood circulation in external gills of young tadpoles of newt and frog (reared from egg or spawn).

11. For upper classes special lessons in "protective mimicry" were given embracing the resemblances most easily observable

in colour, markings, form, etc. (lion, tiger, etc., green lizard, frog), also instances of change of fur colour in response to environment (summer and winter coat), and change in insects (form and colour): stick caterpillar, leaf insect, albinos, leaf locust, etc., also in regard to edible and distasteful insects, the former gradually resembling the latter, though the species are widely different. (Visits to South Kensington Museum, entrance hall.)

The School Museum.

The collection of various objects stored in most schools and labelled "Museum," is often quite unworthy of the name, and from being of little use at the outset, gradually grows into disuse altogether. It usually consists of a number of corked bottles, containing different economic products—seeds and articles of commerce, specimens of manufactured goods at various stages, ores, rocks, etc. The form of cupboard in regular use places the whole at a disadvantage, and objects become crowded and useless as a general exhibit, and quite inadequate to meet the requirements of teaching. Rarely is any care bestowed upon this article of school "furniture," and the curating of what should be made an indispensable adjunct to lessons and lectures is overlooked almost entirely. The work of arranging exhibits systematically, dusting and labelling, and placing the same to the best advantage is no small undertaking. Some knowledge, and plenty of interest can alone qualify for the curatorship of a museum in school, as for a museum elsewhere. Time and thought must be given to make such stores a success, and unless such a curator is available the museum will probably degenerate into mere lumber, hidden away under lock and key, and quite useless as an aid to any form of study.

Where, however, conditions are favourable, suitable show-cases may be obtained, both for permanent exhibits and for objects in circulation, if there is any organised distribution of objects from centres. Sectional cases may also be obtained

for storing sets of material for class use, such cases being readily divided, and the section (or sectional drawer) required may be taken to the class-room using the same.

In proportion as children and students are interested in the welfare of the museum, various contributions of more or less interesting objects will be forthcoming from time to time. Judiciously selected material from such specimens as are offered accumulates a peculiar interest in the school museum; in fact, in many instances the collection consists entirely of "gifts" of this kind.

Change of Material.

Constant change of objects shown is the main factor in maintaining interest in the museum, and from this point of view it may be at once suggested that walls, screens, glazed frames with movable back-boards (containing blank cardboard mounts), show-cases, notice boards, may all be used for "museum" service, the conditions of greatest importance being that a living interest shall dominate all that is attempted, and that some person shall take charge of the whole.

The type of exhibits will be largely decided by the requirements of the studies. In regard to "Nature Study," records and drawings of various forms of animal and plant life will find a place. Groups of specimens for class work may be stored in drawers. General exhibits of scholars and students will form a miscellaneous collection. Mounts showing the life histories of insects (types of families) as in nature, preparations in alcohol illustrating the various stages of metamorphosis from "larva" upward to aquatic insects (dragon fly, water-beetle, ephemera, caddis, etc.), anatomical peculiarities and adaptations observable in the prepared skeletons of birds, frogs, bats, in fact, of any types procurable for comparison—specimens of hides, skins, furs, feathers, the feet and beaks of birds; the shells of crustacea and molluscs, may all be classified and placed, with advantage, as exhibits. Mounts of stick insects, leaf locusts, leaf insects, and of various

moths and butterflies, showing "protective resemblance" (mimicry), are all easily and cheaply procurable, and attract much attention as exhibits.

Practical botany offers much scope for making a collection of common flowers. Dried fruits, systematically arranged and labelled, and exhibited in glass cases, have a distinct place at one time of year, as specimens of leaf and flower buds showing early growth have at another. Collections of leaves, carefully selected, dried and mounted by students, at another time may be introduced. Where facilities occur, "nests and eggs" can often be added to the nature side of the museum. The general utility and variety of the whole will be in proportion to the living interest taken in this very profitable practical work. But such interest must not flag, or that which has been the useful and valuable collection of perhaps many years will quickly depreciate, and will ultimately be regarded as material of no appreciable value, and will be discarded altogether—the history of so many museums of the past.

Let it next be accepted that its own literature, poetry and prose, must accompany the science side of Nature Study. No Nature work can afford to dispense with the spirit of poetry and literature. That feeling for Nature which found its expression so differently in the works of William Wordsworth and Charles Darwin was really the same. Both saw steadily and clearly, and, as posterity is gradually realising, truly. To smaller minds than theirs, their patient elaboration of the smallest issues seemed puerile and insignificant. Their impressions were recorded regardless of time, and bear no marks of Time's hurry, and their conclusions are so proportionately large and comprehensive, that posterity will probably be still occupied for many years to come, in realising the truths with which the philosophy of Wordsworth and the nature study of Darwin were alike concerned.

Wordsworth's poetry is one great contribution to Nature Study; the reading of many of his poems must therefore prove

an aid to the subject of the greatest value. Moreover, for the cultivation of humanitarian interests, nothing could be more appropriate. With his contemporary Hazlitt, "Hartleap Well" was the touchstone—"One that has always been a favourite with me," says he, and again, "Those who do not feel the beauty and the force of it may save themselves the trouble of inquiry further." To-day, also, men find beauty and force and true pathos in this poem as in "Michael" and the Lyrical Ballads and the Sonnets generally.

The many anthologies and selections of poetry now published contain much of the poetry of Nature. The lines to a "Mountain Daisy," to the "Lesser Celandine," to the "Skylark," to the "Throstle" will occur to all, and are typical of many poems descriptive of cloud, rain, sunshine; of flowers, forest, and sea; of favourite animals reared as friends. Again, too, without any indication of title or subject, many poems have passages of deep significance in regard to Nature's ways, worthy of close study and detailed exposition. It is impossible not to find such in the works of all poets.

Of prose reading, too, either of an exact scientific order, or belonging to the realm of "Essay" or other recreative form, there is, assuredly, no lack to-day. The more serious work of Charles Darwin may well be introduced by his own account of the "Voyage of the Beagle," than which no more entertaining work in nature observation has ever been written. This work may be taken as the type of many others by A. R. Wallace, H. W. Bates, and Lord Avebury. In the light literature of to-day will be found a large number of chatty popular works, inexpensive, well-edited, and often well illustrated, including "Nature" essays, records, notebooks, etc. (The names of Grant Allen, Richard Jefferies, Edward Step, and Arabella Buckley, at once suggest themselves.)

Freehand Drawing is another branch of the curriculum directly concerned and correlated with Nature Study. No other branch of school work is so likely to prove an aid to Nature lessons in of bringing *form* and *colour* irresistibly before

the student. It is the custom with some education authorities, where the supply of plant material for such observation and drawing is difficult, to organise a weekly delivery of specimens of leaves, flowers, cuttings, etc., in tin boxes. Where, however, the cost of this procedure makes it impracticable, individual effort among scholars and students will easily supply the season's specimens for lessons and art purposes generally. As a further aid, leaf sprays of various plants and trees may be dried under pressure and mounted on stiff white paper or card, to serve as "drawing copies" when the living material is unobtainable.

Drawing.

For ordinary pencil work and also for colour work, such application direct to nature is most desirable and far in advance, educationally, of other methods of drawing, *e.g.*, from a stiff formal geometrical pattern, and from artificially made designs. Infant's schools as a rule commence well in such matters, training the young mind from the earliest years to see living plants, animals, etc. But in the junior and senior departments of schools at present, drawing is by no means always an expansion of the infant school method, and it is not uncommon to find in the upper part of a senior school drawing weak enough to suggest that there has been no progressive development in correlation with the early infant school beginning.

The use of an ordinary simple pocket lens of, say, one inch focus (cost 1s.), for class use generally, to assist examination of parts of plants, etc., in and out of doors, leads very naturally to the introduction in upper classes of school and college of the compound microscope as an aid to making out structure and interesting details of various kinds.

The Microscope in Nature Study.

All good makers, such as Beck or Swift in London, and Zeiss, Leitz, and Reichert on the continent (obtainable through Baker, High Holborn), offer well-made instruments of many patterns and prices. Any of these stands, possessing a large stage and a good coarse adjustment, will suffice for ordinary class work. Objectives of low power only are necessary,

varying from 2 inch to $\frac{1}{2}$ inch. Microscopes are often sent out equipped with two objectives ($1\frac{1}{2}$ and $\frac{2}{3}$) and two eye-pieces (Nos. 1 and 3). Such a choice of powers answers most requirements, and a "nosepiece" to carry the objectives and render them quickly interchangeable is of great convenience. Mounted objects for special lessons in all branches of Nature Science are readily obtained at the leading opticians (Messrs. Baker, Holborn, and others); but probably the most interesting use that can be made of the microscope is in connection with the study of "pond life," obtained from open ponds on the "excursions" or "journeys" now commonly undertaken, and by means of which the home aquaria, consisting of jars, glass pots and troughs, are stocked with healthy weed, tiny water insects, small tadpoles, rotifers ("wheel animalculæ)," snail "spawn," etc. A little time and trouble bestowed on acquiring the technique and knowledge necessary to the exhibition of this side of nature will be repaid with interest, and with a little careful preliminary help, quite young students may be taught to use the microscope with no risk to itself and with such interest to themselves in observing and drawing as can be enjoyed in perhaps no other study. In many cases the interest of our greatest naturalists was first stirred by the use of the microscope in early life in some such way as the possession of a library open to the child has implanted a love of good reading, and pointed the way to a distinguished literary career later on. The interest and gratification of a few thoughtful children on first seeing the blood coursing vigorously along the external gills of a young tadpole, or through the transparent membrane of the tail, is a pleasurable experience in "Nature Study." The well filled "field" of observation supplied by a drop of stagnant pond water cannot but suggest "other worlds than ours," and nothing is so well calculated to enlarge the field of view in other matters as the conviction driven home by the simplest microscopic observation that we cannot always believe our own eyes.

The microscope should be placed perfectly upright, and a

flat-bottomed watch glass, as sold by opticians, may be used to contain small subjects of observation in water. A dipping tube will easily transfer from the stock at hand whatever is required (plant, leaf, cyclops, daphnia, rotifer, hydra, vorticella, paramœcium, tadpoles, etc.). Small glass micro. tanks are also supplied of various depths, in which water-weed and the "life" existent thereon may be studied.

If any set course of lessons in Botany and Zoology requires illustration of dissected parts (vegetable or animal histology), collections of muro slides bearing on the work may be purchased or hired from the classified list of leading opticians (Watson, Baker, etc.). One of the many books dealing with "Rock Pools," "Ponds and Ditches," "Marvels of Pond Life," "Pond Life," is indispensable to those not fully familiar with the variety of life found in water. Objects may be observed (and drawn from sight where possible), and reference made to zoological or botanical works, or for further information to books well illustrated from microscopic slides. The latter may be found in Hogg "On the Microscope," Carpenter & Dallinger "The Microscope," Davies' "Practical Microscopy," and similar books.

In the study of "insect parts," eyes, simple and compound, antennæ, mouth parts, probosces, organs of touch, stings, legs and appendages, wings, spiracles, tracheæ, gill plates, larvæ of may-flies, etc., there is an intensely interesting and inexhaustible field of observation connected with studies of bees, moths, butterflies, beetles (land and water), housefly, crane fly, dragon fly, may-fly (ephemera), caddis, etc. The anatomy of the "hive-bee" and the adaptation of its parts to the work it has to do, are of the greatest interest and value among many special studies in insect life.

The life histories of the "solitary" bees offer much food for study and thought. In fact, "bee life" generally has an interest exceeded by no other branch of natural history. The works of Fabre and Maurice Maeterlinck, of recent date, have done much to win more and more attention to the

"social" habits, "industry," and "intelligence" of their favourite insects.

It has already been said that in mentioning selected bye-paths in Nature work no particular course can be prescribed. Whatever proves of interest and is practicable must be right. In regard to actual "lessons," too, and the getting and giving of "knowledge," one may be over-anxious as to method. The pursuit of a natural "bent" in or out of school means "interest." There is often pedantry of "form" leading to stiffness, mannerism and over-consciousness, particularly, in teaching, and it is unwise, and perhaps affectation, to talk of knowledge so frequently as "mere knowledge," and in one's anxiety to proceed correctly to underrate the necessity of knowing what has been accomplished so far. No student can afford to ignore the past as history, and observation and inquiry should link up with all that has gone before, using the same as a foundation for further progress and discovery. The "receptive mind," open to all that comes worthily, should be particularly the product of Nature Study.

(M. W. L.)

VI.

CHEMISTRY AND PHYSICS.

It has been already pointed out that the inclusion of science in some form or other in the school curriculum is comparatively recent. The rapid strides made in scientific knowledge during the nineteenth century, and its increasing importance in industry, created a demand for science teaching. This demand was, it is true, grudgingly met; the value of such teaching was not recognised, in spite of Spencer's great plea for science in the schools. At the present time it is hardly possible for a boy to pass through school life without making some acquaintance with the study of natural phenomena.

The particular branch chosen for study will depend on local conditions and the predilections of the teacher. The

country school, for example, will largely choose nature study; girls' schools, for some reason, seem to like botany. Perhaps the commonest branch that is utilised in schools is elementary physics and chemistry, and it is those branches that will be dealt with here.

We can hardly do better than follow the lead of Herbart. The many sided interest which is so great an aid to virtuous living he divides into two:—interest in Nature and interest in Human Nature. Science supplies the first interest. We must make our pupils feel that they live in a wonderful world, a world of ceaseless activities, governed by laws which it is a never-failing pleasure to observe and investigate. Somehow or other, our teaching must give our pupils a reverence for nature, and a respect for the certainty with which these natural laws work. As Huxley put it, a primrose by the river's brim must be something more than a dicotyledonous exogen with a gamopetalous corolla. The dry-as-dust bare "facts" of science must be made to "tremble with song."

How is this to be done? Possibly one way is by a correlation of the science with the reading or literature lessons. The lives of great workers in science, or accounts of their work, may very well be read. Any references to matters of science in poetry, *e.g.*,

> "The hills are shadows, and they flow
> From form to form" (TENNYSON),

should be explained in such a way that our pupils may see that the poet's imagery and the scientist's matter-of-fact explanation are only different ways of looking at the same thing.

The mention of the lives of great workers suggests another point. We do not make sufficient use of the human element in our science teaching. Our pupils do not realise that the things they learn have meant labour and courageous perseverance on the part of men who gave their best energies

to the work because they loved it. This point will be dealt with later.

Great stress is laid by many educationists on the disciplinary aspect of science. Professor Armstrong says:

Training.

"If people learn to weigh things, they will, perhaps, in time learn to weigh opinions." Without subscribing to this epigrammatic statement, it is worth while seeing what "training" functions may be expected of Science.

In all scientific work great use is made of the inductive method of reasoning, *i.e.*, reasoning from particular cases to general principles. Every scientific investigation begins with experiment or observation, or both. The next step is to form a hypothesis, to explain the results of the first stage. Thirdly, this hypothesis has to be verified deductively, by applying it to a new case. This method is an exceedingly useful one, and has many applications. Very many of the problems of everyday life lend themselves readily to treatment in this way, and it is not too much to say that many errors would be prevented by some knowledge of the scientific method.

The heuristic method, advocated so strongly by Professor Armstrong, lays great stress on this aspect of school science. He would treat every boy and girl as an investigator—"the beginner not only may, but must, be put absolutely in the position of an original discoverer."*

Taken in its entirety, this method is impracticable under ordinary conditions. Given very small classes, and very long courses, it might be carried out successfully.† Unfortunately, in the Elementary School, the classes are not small, and the courses are not long. Again, it is not to be expected that

---

* *The Teaching of Scientific Method* (Armstrong).

† Mr. H. G. Wells is perhaps unjustifiably sarcastic, but his words are worth quoting. He speaks of a method "whereby, at the cost of three or four hundred pounds' worth of apparatus, a total neglect of all other studies and the undivided attention of a teacher of exceptional ability, an average child might, with a peculiar sort of thumby thoroughness, learn in the course of ten or twelve years almost as much chemistry as one could get in one of those objectionable 1s. textbooks that were then so common."

young, undeveloped minds can follow alone the paths pursued by great discoverers. The youthful investigator must be guided; judicious hints must be given to keep him on the right track. Yet, after making these allowances, and remembering also that knowledge is one of the ends to aim at, as well as method, the teacher of science will do well to bear this doctrine in mind in his lessons.

There are, then, two main aims in science teaching; first, to create an intelligent interest in natural phenomena; secondly, to give some knowledge and appreciation of scientific method.

It will be noticed that nothing is said of training the "faculty of observation." Seeing that the absent-mindedness of scientific professors has long been a standing joke in our comic papers, it would not seem that science gives a good training in "observation." The fact seems to be, as Professor Adams puts it, that "we observe what we are interested in." Create the interest, guide it, and observation will follow.

Physics and Chemistry.

The teacher of physics and chemistry—at least, he who does not work with a ready-made syllabus—suffers from an *embarras de richesse*. He has so much material and so little time. What shall he choose, and what reject?

First of all, it is no part of his work to train chemists or physicists. Hence, parts of the subject that are more particularly technical may certainly be omitted, and, as far as possible, the subjects chosen for study should be those which lie nearest to the phenomena of daily life. For example, it would be a great mistake to teach a class all about the hydrides of phosphorus, and leave it ignorant of the composition of the air.

Again, the subject should be such that it can be taught without elaborate and complicated apparatus. Such apparatus is objectionable, as far as school use is concerned, for several reasons. To begin with, it is expensive; again, it is apt to have a "you-press-the-button-and-we-do-the-rest" aspect that

renders it mysterious to a class, and the time spent in explaining it might be better employed. When the apparatus can be made by the pupils, in the manual training room or elsewhere, their constructive interests should be employed to the greatest possible extent.

Another point worth considering is the relation of science to other subjects in the curriculum. There has hitherto been much wasted time and effort, owing to lack of correlation between different subjects. For instance, the measurement of length, area, and volume is commonly taken in the science course, at the same time appearing as part of the mensuration. It is far better to hand over this part of the work to the teacher of arithmetic. In the upper classes, at least, much mathematical material can be gathered from chemical and physical sources. Questions on expansions, specific gravity and density, the barometer, chemical actions, etc., are a happy hunting ground for problems in arithmetic, quite within the capacity of the average upper standard boy.

Correlation.

The question of climate, an important one in geographical teaching, calls for some knowledge of natural phenomena. The phenomenon of convection naturally arises in connection with winds and ocean currents. The barometer and thermometer both enter into the study of climate. Some knowledge of evaporation is useful for the same purpose.

The solvent action of rivers is another geographical point very closely linked with the science work.

In fact, the everyday phenomena connected with weather changes, water action, and combustion, supply valuable starting points for science teaching, and such subjects have the greatest claim to consideration in school science work. Where time is limited—as it nearly always is—such branches as electricity, light, sound, interesting and valuable in themselves, must be regarded as luxuries. It cannot be too strongly insisted upon that our great need is to bring our

teaching down to earth—to descend from the academic Olympus in which schoolmasters have dwelt for so long—and make much more use of material lying ready to hand in everyday life.

With these considerations in view, it will be found that of all the branches of physics, *heat* is one of the most suitable for school study, together with elementary mechanics and hydrostatics, and the first named forms an excellent introduction to chemistry. Such special points as the spectrum, the dynamo and motor, the telephone, the magnet and compass needle, telescope, microscope, and flying machines, might very well be dealt with, apart from a connected course, in a few lessons of the "Popular Science" order.

The course outlined in the following pages is not put forward as representing the best possible arrangement. Such dogmatism would be entirely out of place. It is intended to indicate directions in which it should be possible to give a useful course, which should be capable of arousing interest and stimulating imagination. Moreover, it has purposely been made very full in its later stages—too full for the work of many schools, although these parts have been given in an elementary school.

Early Stages.

In the early stages there should be no attempt at anything of the nature of a logical course, neither is there any need for much explanation. The work in the lower classes of a primary school should be largely of an observational and descriptive nature. It should aim at drawing attention to phenomena that would otherwise pass unnoticed, and at stimulating interest and curiosity. It will not be possible at this stage to label the lessons as belonging to this or that branch of science, or even, for that matter, to call them science at all. These early lessons should deal with such things as the more easily known properties of common substances (*e.g.*, salt, soda, coal, common metals), water and its forms (leading to the obvious

differences between a solid, a liquid, and a gas), rain, frost and snow, the examination of common building or clothing materials. The lessons should be far more experimental than was the case with the old "object lesson." Then the solvent power of water might be treated; no attempt at scientific accuracy need be made; it will be sufficient at this stage to demonstrate that substances differ in their capacity for being dissolved by water, and that, as a rule, hot water dissolves solids more readily than cold.

Such lessons lead on almost naturally to the study of heat. Here the work will be more connected and continuous, but still the quantitative aspect should not be prominent. The phenomena of expansion come first; the pupils can see for themselves that the hotter a gas or liquid becomes the larger it gets. It is not difficult to pass from this to the thermometer. It does not take long to make a class appreciate the usefulness of being able to find how hot a body is; then why not make use of this expansion property to obtain a measure of the *hotness* of a body? The question next to be considered is, What shall be used? The objections to solids and gases for ordinary use may be dealt with, and a liquid decided upon. The question of what liquid allows the teacher to put forward the *obvious* claims of mercury (too much detail need not be given). The construction of the mercury thermometer follows. It may reasonably be urged that this whole question bristles with difficulties; the meaning of temperature among them. This is quite true, but these difficulties may well be left to a later stage. The great thing at this point is that children should know what a thermometer is, and that it tells *how hot* a body is.

Next the phenomena of fusion, evaporation and ebullition can be dealt with. Children at this stage will already possess a great deal of unorganised knowledge of these points. They will know that when water freezes, ice is formed; that water can be changed by steam into heat; that rain water on the

pavements dries up in time. These statements want to be systematised, and new knowledge "apperceived" in the light of them.

With regard to fusion, it can be shown experimentally that, when water is cooled sufficiently, it freezes and forms ice, and that this ice always melts at the same temperature—one of the "fixed points" of the thermometer. The effect of cooling other liquids—methylated spirit, milk, salt solution, etc.—can be tried, and the results compared with that of water. Similar experiments should be tried with regard to evaporation and ebullition. The effect on the rate of evaporation of temperature, of removing the air, of the extent of surface, and of the dryness or moisture of the air may all be tried experimentally, and the cooling effect should be shown. The latter point has one or two interesting applications. Many boys will know from personal experience that even on a warm day it is not always as comfortable as it might be to dry oneself in the open after bathing. They can learn why this is; why, also, there is a great risk of getting a "chill" from sitting about in damp clothes; why rapid motion diminishes this risk; and why the plan said to be adopted by Scottish shepherds of putting their coats under a large stone during rain is a good one.

The transmission of heat, treated very simply, can now be dealt with. Conduction and convection lend themselves readily to experimental treatment. Some knowledge of what conduction means may explain what is often a great puzzle to ill-informed minds; that is, why we keep ourselves warm by wrapping up in flannel, and keep ice cold by the same means. And convection has a useful application to the question of ventilation, winds and ocean currents. Radiation is too difficult to be more than touched on here, except to point out the existence of this method of transmission, which takes place independently of material contact.

This course would, later on, be taken again, amplified, and made more quantitative. The thermometric scales and their

conversion one to another, the advantages and drawbacks of mercury as a thermometric substance, other thermometric substances for special use, the finding of melting points and boiling points, latent heats, the conditions affecting evaporation, and the measurement of heat, may be dealt with, as well as the laws of the expansion of gases. The measurement of heat especially gives great trouble to most boys.

The study of heat does not cover the whole ground of an elementary physics course. Gravitation and the chief properties of fluids (*e.g.*, capillarity, fluid pressure), and the working of pumps should be taken; so should elementary notions of force and simple machines. The pressure of the air and the barometer must be dealt with.

The amount of mechanics taken will naturally be small. The notion of a force is not a difficult one for children to grasp—they are unhampered by metaphysical subtleties as to what a force actually is. The value of lessons on resultant force, parallelogram of forces, etc., in this particular course, is at least doubtful, and the application of this idea of force should be to levers, pulleys, and simple machines generally. Gravitation should be dealt with very simply; centres of gravity of cardboard figures may be found. This question provides a convenient opportunity for a warning, that a thing is not explained by giving it a name. To answer the question, "Why does a stone fall to the ground?" with an airy, "Oh, it's gravitation," is neither sensible nor scientific.

The study of capillarity would deal merely with the rise of water in narrow tubes, and probably would go no further than to discover that the wider the tube the less the rise. This point can be further illustrated by the rise of the liquid in a lump of sugar held on the surface of a cup of tea, by loops of thread in soap solution, by the wick of an oil lamp, and by the sticking together of flat glass plates when wetted.

The study of combustion is extremely useful as an example

of scientific method. The first stage is to observe the effect of heating various substances. Some burn, others do not; some disappear entirely, or nearly so; some are apparently unaltered, others undergo a marked change in appearance. The balance should be used next, to discover if any changes of weight occur.

The Study of Combustion.

The results will suggest several problems. Some substances, notably many metals, become heavier Hence they must have obtained something from somewhere. Whence comes this mysterious addition?

A little consideration will suggest the probability of the air as the source of it. The next step is to find some means of testing this hypothesis. The experiment can be tried, for example, of heating some copper or lead away from the air, by covering it with sand. Or the metal may be heated in an enclosed portion of air.

Here references may be made to the work of the early chemists on burning. Some of the experiments of the Oxford chemists may be repeated, *e.g.*, Mayow's experiment of burning a candle in a confined portion of air. After the experiment, and a discussion of the results, Mayow's own observations on the work may be referred to.*

Phosphorus and hydrogen can be burnt in a similar way. The resemblance in the experiments, as regards the apparent effect on the air, will be easily seen.

The results of these experiments should then be summed up:—(1) That the air seems to consist of two parts, one only of which allows burning to take place in it. (2) That the active part is present in a much smaller proportion—about 1 part in 5 is active. (3) That the active part disappears in the process of burning.

* The Alembic Club Reprints are very useful in this connection. They are inexpensive, and some of them certainly deserve a place in a teachers' reference library.

The next question that arises is, What is this active part; and how can we obtain some of it? Refer to the increase in weight of the metals treated in air. Suggest that *possibly* the active part of the air has gone into the metal.

Then comes the problem of getting it away from the metal, if the hypothesis is correct. Possibly, suggestions may be forthcoming from the class. Try the effect of heating some of the red substance formed when mercury is heated in air. If the active part of the air is set free by this, we should be able to let a taper burn in it. Show that a glowing splint bursts into flame when held at the mouth of the tube. Point out, too, that the mercury comes back. Hence it seems almost certain that this gas, which causes a glowing splint to inflame, is the active constituent of the air.

The name of Joseph Priestley naturally occurs in connection with this. An account should be given of his work, and the history of the phlogiston theory dealt with. The story of the rise and fall of this theory is a most interesting chapter of scientific history.

Lavoisier's confirmation and continuation of Priestley's work should be dealt with, because it marks the final downfall of the phlogiston theory and the substitution of a new one.

The properties of this active constituent of air should then be demonstrated. For this purpose it can be prepared by the ordinary laboratory method from potassium chlorate and black oxide of manganese, but no technical explanation need be entered into with the class as to *why* the active constituent of air is obtained thus. The demonstration of its properties will afford an opportunity of naming the gas, and explaining why Lavoisier called it acid-producer. The correctness of Lavoisier's assumption can hardly be tested at this stage, but it affords an interesting problem for future consideration.

The Study of Air.

There remains the inactive constituent of the air. Its properties may be investigated, and the class must see the

appropriateness of Lavoisier's name for it, azote. The reason for the modern chemical name can hardly be found experimentally, for purposes of class teaching at any rate, and a statement of facts must be sufficient.

There are other constituents of the air that have to be dealt with—water and carbon dioxide. The gradual drying up of the streets after a rainfall, or of small ponds in dry weather, suggests the possibility of the presence of water in the air. Its presence may be demonstrated, conversely, by bringing a vessel containing a freezing mixture into the room. The frost deposited on its sides may be subjected to tests, to show that it is water.

The discussion of this question of water vapour in the air is a convenient peg on which to hang the treatment of deliquescent and hygroscopic substances; for example, the use of seaweed as a "weather indicator" can be explained. The use of the barometer for the same purpose might also be touched upon and, perhaps, dealt with.

A good way of approaching the question of the presence of carbon dioxide in the air is by the experiment of breathing into some lime water. In some text-books (*e.g.*, Shenstone's *Inorganic Chemistry*) a simple experiment is given, to show the difference between inhaled and exhaled air. A piece of charcoal may be burnt in air, in a gas-jar, and some lime-water added. These experiments will show that the products of burning charcoal, like air that has been breathed contain something that has the property of turning lime-water milky. There is also something in ordinary air, though apparently to a smaller extent, that has the same property. As far as we know, the gas formed by burning carbon is the only substance that has this property. The name, oxide of carbon, could be obtained from the class in the light of previous knowledge.

The chief properties of this gas should be investigated preferably, perhaps, by obtaining it from the combustion of

carbon. Later, the whole question of the action of heat and acids on carbonates can be dealt with in the light of Black's work.

The presence of an increased percentage of carbon dioxide in expired air leads naturally to some important and useful physiological knowledge. The function of the lungs and the blood, and, in fact, the general phenomena of metabolic and catabolic changes, can very well be approached here. The necessity for fresh air and proper ventilation, and a clean skin, are matters of vital importance, and there is something decidedly wanting in a curriculum which allows children to leave school without knowing them; but hygiene, as a separate study, is not always possible in the crowd of subjects demanding recognition, and much of the important part of this subject can be given as part of a general science course.

The part played by vegetation in the economy of nature should also be investigated. It is possible to arrange an experiment fairly simply to show that plants (*e.g.*, the Canadian waterweed of our canals) give out oxygen. The curiosity of the class should be aroused as to what becomes of the carbon dioxide, which, as the experiments have shown, must be produced in large quantities in the air, and yet the quantity present in air does not appreciably increase. Some idea of the wonderful rhythm and reciprocity of nature will thus be conveyed.

The function of the nitrogen as a diluent of the oxygen is another point that requires attention. The properties of the two chief constituents of the atmosphere will suggest the great importance of the nitrogen. Some hint of the function of bacteria in the feeding of plants with atmospheric nitrogen may be thrown out.

The rusting of iron is an excellent problem connected with the air. It is a matter of common knowledge that, if iron is left exposed to damp air for some time, it rusts. Is it the dampness, or the air, or both, or is it something in the

iron itself that causes the rusting? Is it—to use Professor Armstrong's phrase—a case of "murder" or "suicide"?*

The study of water will form an important part of elementary science. Its physical properties should be known from work at an earlier stage, before the systematic study of it begins. The chief properties should be recapitulated—its freezing and boiling points, its high thermal capacity, its poor conducting power, its anomalous expansion.

Water.

Perhaps one of the most outstanding properties of water is its great power of solution. This should be tried for substances of varying solubility. With substances such as common salt there is very little difficulty in deciding that water does dissolve them. With others, plaster-of-Paris, for example, the solubility is the reverse of obvious, and it will probably be found that the class jumps to the conclusion that they are insoluble. However, the salutary demon of doubt is not difficult to arouse in their minds, and suggestions may be forthcoming to settle the question. The solubility of common substances may be tried also; garden mould may, for example, be subjected to the same process as the plaster-of-Paris. It is a short step from this to the consideration of natural waters, and the various substances found in solution in them. Some "fur" from a kettle can be obtained, and its properties investigated. It is hard, and of a dirty white colour. Experiment shows that it apparently does not dissolve in distilled water, but that when hydrochloric acid is added to it, effervescence ensues, and a gas is evolved which turns lime-water milky.

Now, this fur is never obtained from rain water, but only from tap or river water, and the relative quantities of it obtained from tap water in different parts of the country vary considerably. Evidence, therefore, points to its being something dissolved from the earth. Further evidence shows

* *The Teaching of Scientific Method.*

that where chalk or limestone is present in the earth in any quantity the fur obtained is larger in proportion than where the chalk is absent. This limestone, or chalk, effervesces with an acid exactly as the fur does. Therefore, most probably, the fur is largely dissolved chalk. The class may be led to suggest confirmatory experiments. This, it must be remembered, does not preclude the presence of other substances, *e.g.*, calcium sulphate.

Now, chalk does not dissolve in distilled water. This can be proved experimentally in the usual way. Why then, should it be found dissolved in tap water? Perhaps the rain water, from which the tap water came in the first place, contained something which gave it the power of dissolving chalk. What could it contain? It has passed through the air, and may have obtained something from the air, *i.e.*, a gas. Obviously, the most soluble gas present will be dissolved most easily. The work of past lessons has shown that, of all the gases present in the air, carbon dioxide is the most soluble. Therefore the next step is to find, by experiment, whether the presence of carbon dioxide in the water is sufficient to account for the solution of chalk.

The hardness of water, the difference between temporary and permanent hardness, and the effects of this, industrial and domestic, should be dealt with next. Here, too, will come the geographical aspect of the solvent power of water—how the rivers "sow the dust of continents to be." The help of the arithmetic lessons may be called in to calculate how many tons of dissolved solid are carried to the sea per week, or month, or year, by a river of a given size, flowing at a given rate. Points of contact with geology are also obvious; chalk and other limestones were marine deposits.

The presence of a certain amount of dissolved limestone, or other mineral matter, in drinking water, is not generally objectionable, but the presence of organic matter is extremely

objectionable, as it points to sewage contamination. The chief methods adopted for testing for organic matter in water, *e.g.*, Nessler's Reagent, should be touched upon.

Then we have to consider water in its chemical aspect. This can be very well approached through the properties of hydrogen. When dilute sulphuric acid acts upon zinc, an inflammable gas is given off. An experiment can be easily arranged to obtain some of the products of combustion. Tests can be applied to it, to show its identity with water.

Water—Chemical Properties.

Referring to the lessons on combustion, it should be possible to obtain from the class that hydrogen, on burning, combines with the oxygen of the air. Indeed, it may be shown experimentally that, in the burning of hydrogen, the same proportion of the air disappears as in other cases of burning. To investigate the question still further, pass hydrogen over heated oxides, *e.g.*, copper oxide, and collect and test the liquid formed.

Having ascertained, then, that water is somehow composed of hydrogen and oxygen, the problem may be attacked from the other end. Pass steam over red-hot iron filings, and show that hydrogen is produced. Electrolyse some water, act on some with sodium or potassium, and observe the results.

The historical side of chemistry may be dwelt on here. The work of Cavendish and Dumas on the composition of water is classical, and their great industry and painstaking accuracy and skill should be emphasised.

The properties of the common mineral acids—sulphuric, hydrochloric, nitric—form an interesting study. They should be introduced under their common names—oil of vitriol, spirits of salts, aqua fortis. The method of manufacture of each can be experimentally illustrated. Their action on metals and common substances can also be shown. The study of these acids opens up many avenues to the study

The Common Acids and Alkalis.

of gases—the oxides of nitrogen, chlorine, etc., as well as that of the salts of common metals. The common alkalis, and the neutralisation of acids by alkalis, will naturally be dealt with here. It is more than doubtful whether "formulæ" should be used to any important extent in such work.

An exceedingly good "problem" study is found in Black's work on lime and limestone. It is hardly necessary to give details here; the Alembic Club Reprints, and most of the common text-books, will supply them.

The nature of a chemical compound, as distinct from a mixture, may well have some attention also. This point can be easily illustrated with a mixture of iron and sulphur, which is afterwards heated, and many examples can be found in previous work, *e.g.*, the composition of water. It may be possible to arouse curiosity as to what becomes of the constituents of a compound when they unite to produce something entirely different. It is probably inadvisable to dogmatise much about the atomic theory, but some hints of its importance and interest should certainly be thrown out. Any method of teaching is bad which tends to the conviction that nothing remains to be learnt and that the open book of the universe has been read through from cover to cover.

Science and Cookery.

In girls' schools, where cookery and laundry work are taken, the science lessons should help those subjects, and *vice versâ*. For example, the question of hard and soft waters is seen to be not a question of mere academic interest, but of great practical importance, when its application to laundry work is made.

Cookery lessons can be materially helped by a proper correlation with the science work. Starch, sugar, albumen, food stuffs generally, fermentation, coal-gas and flame, are a few topics that could be dealt with experimentally in the science lessons, and then very usefully applied to the art of cooking. A London headmistress said, quite recently:—

"I believe most intensely in the intimate correlation of chemistry and cooking."*

These branches of science are very rich in examples of what human industry has achieved. The point has been touched on before in this chapter, but it may be emphasised again that science teaching will gain greatly in its influence if this aspect is properly brought forward. Indeed, a very good scheme could be based on the work of great scientists. For example, the study of combustion could be definitely based on the lives of Priestley, Lavoisier, Scheele, Black, and the Oxford chemists.

Biographical.

Even the centuries before Natural Science, as such, existed at all, have their message for to-day. In the light of our knowledge, we can see how error arose in the past, and perhaps may learn how best to avoid mistakes in the future. Above all, the call of the past to us is an appeal to the best that is in us. "Were I a schoolmaster . . . I would, when the fitting time came, take every boy under my charge to Westminster Abbey . . . to the spot where, within ten yards of each other, Newton and Darwin rest. There would I bid him remember how England, through these her sons, has reared two of the great guiding-lights of the human intellect; and I would urge him to say to his motherland, as Stevenson to his father:

'This hast thou done; and I—can I be base?'"†

All our schoolchildren know something of Drake and Nelson; have not Galileo, Roger Bacon, Newton, have not Priestley, Cavendish, Dalton, Faraday, a title to equal fame? The story of the lives and work of great scientists teems with interest. Can we not, then, in our science lessons, link on these great names to their discoveries, and withal, enlist the child's capacity for hero-worship to aid its interest in these achievements?

---

* M. A. Gilliland, *School World*, Aug., 1908.

† Kappa: *Let Youth But Know.*

The beliefs held from time to time are not without their uses to us, if only as warnings. From the time of the alchemists, who formed theories first and experimented afterwards, down to Stahl and the "phlogiston" theory, we see how prejudice and preconceived ideas have blinded the minds of even great men.

The whole history of the "phlogiston" theory is a wonderful example of the way in which men cling to old beliefs, in spite of overwhelming evidence that they are wrong. The extraordinary way in which the theory was bolstered up by the assumption that phlogiston was a "principle of levity" (*i.e.*, had a negative weight), when the balance astounded the eighteenth century scientists, by showing that many substances became heavier on heating, is both interesting and typical. Priestley's error, too, in the same direction, has a valuable moral. He heard of Cavendish's discovery of "inflammable air" (hydrogen), and its extreme lightness. What more natural than the thought that this "air" might be phlogiston? Priestley proceeded to argue in a perfectly scientific manner. When metals burn, they lose their phlogiston, and leave the calx. Therefore, if I put the phlogiston with the calx again, I may get the metal. Being a true scientist, he proceeded to put his hypothesis to the test. He passed hydrogen over the heated calx of lead. He got the lead back again, and the gas disappeared at the same time! Hence, the "inflammable air" was probably phlogiston. He noticed that a little moisture was produced, but he did not attach great importance to it. Yet this moisture, small in quantity though it was, was of the utmost importance. Had he taken it seriously into account, he might have changed his whole opinion. Could there be a more striking example of the fundamental importance, in scientific research, of careful attention to apparently trivial details?

It is, of course, quite obvious that chemistry or physics

could hardly exist as sciences without the help of that most valuable piece of apparatus, the balance. Yet, from the point of view of the elementary teacher, who has no laboratory in which his pupils can carry out experiments for themselves, the all-absorbing devotion to the quantitative aspect, as recommended by Professor Armstrong, has serious disadvantages. The process of weighing takes time. While it is going on, the class has to wait, and not being of that ideal keenness that we dream of in our optimistic moments, becomes fidgety and inattentive. Again, the consideration of time is most important, in an elementary school, and time may be more profitably spent than in aiming at quantitative accuracy in experimental work. Hence, where the science teaching has perforce to be confined to class work, the use of the balance should be confined to parts of the work which cannot be done without it.

Quantitative Work.

It goes without saying that, wherever experiment is possible, it should be tried. Apart from the zest and interest thus given to a lesson, the value of the appeal to experiment should be emphasised in all science work. To all questions which arise in the course of the lessons, the attitude of the class should be, "Can we try this for ourselves?" This attitude must be fostered.

Experiments.

The successful carrying out of experiments requires care and forethought. The apparatus should be as simple as possible, and care must be taken to ensure the whole of it being at hand when it is wanted. Nothing is more annoying and distracting than to find, when halfway through an experiment, that further progress is hindered for want of a pair of tongs, or a box of matches, or some similar small item that has been overlooked.

In schools that do not indulge in the luxury of a paid monitor for the purpose, it will economise the teacher's time

to utilise the services of one or two of the older pupils to prepare apparatus. They will need to be shown how to bore a cork and to bend glass tubing, that they may be able to fit together efficiently what is required. They must, too, be impressed with the necessity for cleanliness and order; everything must be cleaned and restored to its proper place after use. It does not take long for these youthful assistants to get into the routine of the work, nor, when once they know what to do, and where to find things, does it necessitate much expenditure of time on their part. The important thing is that the teacher should have ready the list of the apparatus he requires in time for its preparation before the lesson.

Equipment.

Many schools, perhaps a majority of elementary schools, have no specially fitted science classroom, with a bench on to which gas and water are laid. The ordinary classroom has to suffice. In these cases, the question of gas and water supply has to be considered. The latter, for ordinary purposes, can be met by a trough or a pail; a second one is useful, but not indispensable, for waste. Experiments involving a flow of water are out of the question. The gas supply is slightly more difficult to arrange. A spirit lamp is an exceedingly poor substitute; the only thing that can be said in its favour is that it is better than nothing. A piece of rubber tubing placed over the ordinary gas jet is apt to be a nuisance. It has a nasty habit of doubling up and stopping the supply, as the gas jet points upwards, and the tube has to curve downwards. A more satisfactory plan is to have a tap, pointing downwards, from the central pipe from which the burners radiate. This tap should be such that a piece of rubber tubing can be screwed, or otherwise fastened, to it. In an ordinary classroom this should not necessitate a very great length of tubing.

It is not generally essential to try all experiments beforehand to ensure success. Where the experiment is a new one, devised by the teacher, it is, of course, advisable, but with

what may be called routine experiments with which the teacher is familiar, a preliminary trial should not be necessary. In the case of apparatus for preparing gases, care should be taken to see that the joints and corks do not leak. A leaky cork, discovered in the course of a lesson, is a sore trial.

No doubt, as a counsel of perfection, one ought to try all experiments beforehand. But it must be borne in mind that the points raised at this juncture refer to schools which have to make the most of the conditions of their existence. The attitude of such schools has, perforce, to be one of compromise. Time has to be utilised very economically, and it would scarcely be possible to find the time to have a preliminary performance of all experiments, even if it were necessary.

Practical Work.

Where there is laboratory accommodation, the pupils will be able to perform experiments for themselves. These experiments should be intimately connected with the class work. They should be, in part, illustrative of past lessons, and in part preparatory to those to come. The apparatus should be such that the pupils can fit it up for themselves, as far as time will allow. It is possibly a mistake to insist on quantitative accuracy. A recent article speaks of the "paralysing influence" on young pupils of "the exaggerated importance attached to gravimetric methods,"* and certainly experience seems to show that this is the case; the time for exact investigation comes later. Many points in the course outlined above provide experiments—solution in water, distillation, boiling, freezing, of various liquids; experiments on evaporation, are all available. The whole question of combustion gives a wide field for experiment. Many different

* *School World*, June, 1908. "The Teaching of Science in Secondary Schools."

The controversy between Professors Armstrong and Hall has been already referred to (see Vol. 1, p. 3). Also the interesting controversy between Professors Armstrong and Ramsay (Vol. 1, p. 15).

substances can be heated, and the effects noted, including the gain or loss in weight, and experiments can be devised to find what the gain or loss is. Perhaps, too, the properties of common acids and alkalis can be investigated, although in some circles it is considered undesirable to allow young students to use these substances.

It is well to make the course as elastic as possible. That is to say, do not bind every pupil down to a fixed series of experiments. The less enthusiastic, the indifferent—alas! like the poor, they are always with us—will be none the worse for having their path marked out; keen boys, however, who are interested in their work will often wish to try an experiment of their own. This they should be allowed to do, with the proviso always that the suggested experiment really bears on the work in hand, and is practicable under the existing conditions. Let the boy do the experiment in his own way, even where the teacher knows that that way is wrong. We gain valuable knowledge through mistakes.

Where there is no laboratory accommodation, something can yet be done, at the cost of a little trouble, to give the class a share in the experimental work. In the first place, various boys can be called upon to perform the class experiments, under the teacher's direction. It is also possible for the whole class to carry out an experiment, three or four of them working at one time, their places being taken as they finish. Such work can go on during the whole of a morning or afternoon session. Experience has shown that this plan can be made to work very smoothly. The boys know the order in which they are to work. The experiment, and any necessary directions, are given to the whole class. The first few start; when they have finished, and left the apparatus clean and tidy, they take their seats, and the next set begin. This can proceed without any serious interruption of other lessons.

The question of note-taking calls for a word or two. In

Notes.

some schools, it is hardly too much to say that notes form an absolute obstacle to teaching. The class has to prepare an elaborate note book, with beautiful diagrams and a plentiful supply of red ink. This grasping at the shadow and losing the substance is a vicious practice, but as long as so much importance is attached to the degree of excellence shown in the note books, the plan is not likely to disappear.

The teacher is on the horns of a dilemma. To dictate notes takes up—one can almost say wastes—the time that should be given to the lesson. Dictated notes are easily and rapidly glanced through. On the other hand, notes written by the pupils themselves take a long time to examine, and they must be examined. Such notes are really of value as composition exercises. Before a boy can write down the gist of what he hears and sees, he must grasp it, and the teacher has in such a record a test of the success of his lesson. The boy is gaining valuable experience in what is practically a form of *précis*-writing, of extracting the essence of a series of statements, and rejecting the comparatively unimportant. Hence, the fact that the pupil writes his own notes ensures attention to the lesson.

One feels inclined to apologise for mentioning the subject at all. The amount of clerical work demanded of teachers is so large, and has so great a tendency to increase, that one shudders at the thought of adding to it. Yet, there seems no other way. If note taking is to be of any use at all, the notes *must, as a rule, be the pupils' own*, and the teacher must examine them. If this cannot be done, one would almost suggest doing without notes at all.

Where practical work is done, notes of the experiments must be taken *while the work is going on.* These can be copied out afterwards, and should form a valuable record of the pupils' work. This written record of results is an essential part of laboratory practice.

The pupils should have practice occasionally in writing out an account of what they have seen and heard in the lessons. This can be done in composition or writing lessons—or for homework, where the latter is customary.

But whatever measure of skill can be attained in our science lessons, nothing should blind us to the fact that the *romance* of science is what exerts most charm on boys. One form of that romance has been already referred to, the records of persistence and heroism, of which the history of discovery and invention is full. Another form is that which gathers around explosives, anæsthetics, vibrations of the mysterious ether, the boiling (!) of liquid air on ice, and a whole series of electrical phenomena. And one "romance" there is which no school should forget; the story of how, ages ago, before human eye existed to see them, the forests that grew in the humid air and on the oscillating shores of the carboniferous oceans were sealed up; and how, ages after, they supplied energy to the engines of Europe and yielded the wonderful aniline dyes that give charm of colour to modern fabrics.

Yet it is often with a feeling very like despair that the teacher goes from the ideals of the study to the realities of the classroom. He wants his science lessons to be the means of showing something of the wonder and mystery of the world to the young minds in his charge. In the schoolroom he finds himself immersed in apparently trivial details.

But he will be very wrong if he let slip his enthusiasm and his aims. Every detail of the work, every experiment, may do something to further his end. His is an "earthly story with a heavenly meaning." The earthly story is ready to his hand. The heavenly meaning may come slowly to his pupils; but if he keep alive his own sense of the glory of this world, he may impart by his work the seeds of an ever-growing delight in the works of nature, incapable of being tested by any examination, but a very powerful weapon against all that is trivial and mean in life. (W. J. S.)

CHAPTER IX.

Songs as Knowledge-Links.*

WHEREVER speech is uttered songs are sung; and many of these are older than our history.

The "Arthur" of Tennyson is the same Arthur who, in song, named the everlasting hills. The story of La Fontaine's Milkmaid had been sung in India thousands of years before he wrote, and the Siege of Troy is the subject alike of Homer's *Iliad*, and of a Suffolk "horkey ballad."

Before man was enabled by the alleged invention of Cadmus to record thought in writing, the laws, morals, and religions of the world were taught by song. The Phœnicians, Egyptians, Hindoos, Jews, and after them the Greeks and Romans, the Britons, Scandinavians and Celts, all had their bards and minstrels who went about among the people, instructing them in time of peace, and inspiring them to heroism in war. Song is older than history and mythology, for it nursed them in their infancy and endowed them with their charm and vitality.

In our own land, the light of learning, which had been extinguished in other European countries by the overthrow of the Roman Empire, was kept alive and fed and nourished with pious care. From the colleges of the bards—the schools of song—there went forth among the people teachers, who imparted every branch of learning—law and religion, science and literature, through the medium of verse.

They perpetuated in song the memorable incidents of their time, and kept alive the love of country and religion by singing

* This title explains and justifies the chapter and redeems the promise held out on *p.* 103, and, indeed, goes beyond it. History, literature, nature-study, in fact every subject, could be aided and illuminated by a knowledge of songs.—*Editor.*

the deeds of national heroes, and recounting in song the joyful occurrences in their history.

Song was the earliest means of giving expression to the aspiring intellects of nations stepping into the light of civilisation; by it the aspirations of the human soul have been made known, and all that is worthy held up to worship. Some of the finest characters in the world's history have been influenced by song; many a great man has left it on record that he owed much to the impulse derived from songs in which were expressed some wise saw or worthy injunction.

From the earliest times every country has possessed its national songs, its war songs, its love songs, and its convivial songs, which have often exercised a greater power than works of higher poetical and musical pretentions, because of their native strength and simplicity, their depth of genuine sentiment and fine natural passion. In the spacious days of Queen Elizabeth, the popular reason and the popular heart were especially appealed to through the medium of song.

In the year of the Spanish Armada, 1588, William Byrd, who was at one time organist of Lincoln cathedral, and at another Gentleman-of-the-Chapel-Royal, published one of the best Elizabethan song books, under the title *Songs of Sadness, Piety and Gaiety.* He was both song writer and composer, and is best remembered to-day by his musical setting of the song *My Mind to Me a Kingdom is*, the words of which were written by Sir Edward Dyer, diplomatist and poet, who undertook missions to the Low Countries (1584) and Denmark (1589).

Master Thomas Campion, a physician, wrote many songs, to all of which he composed the music. *Come Cheerful Day* was one of the favourites of his time, and two of considerable moral value are *The Man of Life Upright* and *Jack and Joan.* It is probable that he was a relative of the Jesuit Edmund Campion, who was executed in 1581 for treasonable practices in connection with the Bull of Excommunication

of Pope Pius. Frances Meres, in his *Wits' Treasury*, 1595, mentions Campion with favour, and in 1593 George Peele, the dramatist, pays him a compliment.

A favourite song of this time was Thomas Ford's *Since First I Saw your Face*. This song is still sung to the music of John Dowland, one of the greatest of Elizabethan musicians, and is remarkable as being one of the earliest melodies written by a trained musician in modern tonality.

James Shirley, the last of the old English dramatists, wrote *Death's Final Conquest*, the last two lines of which we have all been taught, I suppose, for they have figured largely as copy book headlines :

> " Only the actions of the just
> Smell sweet and blossom in the dust."

It has a place in Ritson's *Representative English Songs*, arranged by Edward Coleman for two voices.

In the songs of Elizabethan time there is such a fulness of thought, such a soundness of morality, and such an exuberant life, that one can only marvel at their absence from the school books of to-day.

Many men of importance in the history of our country have written verses which might well be used in school singing, for example, Henry Howard, Earl of Surrey, the last victim of Henry VIII., and Sir. T. Wyatt (sometime favourite of that king), of whom it has been said—by a joke he occasioned the reformation in England, and by a well-told story planned the fall of Wolsey. Thomas Dekker, the dramatist, wrote *Golden Slumbers*. Michael Drayton, Poet Laureate, (1626), wrote *Summer Eve*, a favourite song of the ladies of Elizabeth's Court. Drayton also wrote the spirited *Ballad of Agincourt*, and, I believe, *The Song of the English Bowmen*, which describe what is, perhaps, the most glorious event in English military history. In connection with these should be read King Harry's address to his soldiers, in *King Henry V.*, Act. IV. Scene iii.

George Herbert, descendant of the great House of Pembroke and brother to Edward Herbert, famous as Lord Herbert of Cherbury, wrote *Sweet Day, so Cool*, while Rector of Bremerton, to which living he was presented by Charles I. This song is the gem of his creations.

William Cowper's *Boadicea* records the bravery of the British Queen of the second half of the first century, who, wronged by the Roman soldiers, collected a great army and for some time waged successful war against the invaders, but was eventually conquered, and ended her life by suicide. Another of Cowper's songs worthy of remembrance is *The Loss of the Royal George.* With its commander, Rear-Admiral Kempenfelt (renowned for his out-manœuvring of the French fleet under De Guichen, 1781), and over eight hundred men, women and children, the *Royal George* sank suddenly in Portsmouth Harbour, 29th August, 1782. Sir Henry Yule, in his song, *The Birkenhead*, pays a tribute to the heroic discipline of the 500 soldiers who, after ensuring the safety of the women and children, formed up on deck, and standing to attention went down with the troopship near to the rock upon which it had struck, off Simons Bay, South Africa, on January 7th, 1852.

W. E. Henley, poet and essayist, wrote *England, My England*, and edited a splendid collection of songs for boys, entitled *Lyra Heroica.*

Charles Mackay, whose songs first appeared in the *Daily News* when Charles Dickens was the Editor, has a national reputation as a song writer. Among his best will be found *England over All*; *To the West, to the West*; *Cheer Boys, Cheer*, and *There's a Land, a Dear Land.*

The Pilgrim Fathers and *England's Dead*, with other of Mrs. Hemans's songs might, with advantage, be oftener sung.

In Scott's song, *Bonnie Dundee*, figures John Graham, of Claverhouse, who, created Viscount Dundee by James II., raised the standard of revolt against William and Mary in

1688. His life and character have ever been the subject of bitter controversy. The Cavaliers called him "Bonnie Dundee," but to the Covenanters he was "Bloody Claverhouse." In the third verse of *The Campbells are Coming* is a reference to John, Duke of Argyle, who commanded the royal forces in Scotland in 1715 against the ill-concerted expedition in favour of James the Pretender, for which Lords Derwentwater and Kenmure were executed on Tower Hill, February 24th, 1716. Another well-known Jacobite song is *Charlie is my Darling*, while the fortunes of the man who was Jacobite or Hanoverian by turns is described in *The Vicar of Bray.*

One stormy day in July, 1793, while riding with a friend over the moors in Kirkcudbrightshire, Burns composed the song, *Bruce to His Men at Bannockburn*, from the first line of which its title is generally taken, "Scots, wha hae wi' Wallace bled," in the verse and words of which is embodied the very spirit of patriotic heroism. Another song concerning the history of Scotland is Tannahill's *Thou Dark Winding Carron*, which has reference to the battle of Falkirk, 1298, when Wallace, partly through the treachery of two Scottish nobles, was completely defeated by Edward I. The problem of Irish emigration has given rise to quite a number of songs, among them may be mentioned *Come Back to Erin*, *Off to Philadelphia* and Lady Dufferin's *Irish Emigrant.*

With such a wide and varied choice, it is remarkable that for so many years school song books should have been little else than collections of German airs, set, more often than not, to verses very faulty in construction, and containing nothing of educational value.

There are now upon the market many excellent books of school songs which will enable teachers to do as did the bards of old, make known through this happy medium the landmarks in our Empire's growth; the famous in court, in camp, in field; the great in the country's literature and the noble in our nation's life.

Perhaps the most perfect love song in any language was written by "Rare Ben Jonson," one of the brightest lights of England's most opulent age of literature—*To Celia.*

"Drink to me only with thine eyes,
And I'll pledge thee with mine;
Or leave a kiss within the cup,
And I'll not ask for wine."

Until quite recently the music of this song had a place in the Wesleyan Church Hymnal, under the title *Prospect.*

Christopher Marlowe, Shakespeare's predecessor and companion, wrote:—

"Come live with me and be my love,
And we will all the pleasures prove,
That valleys, groves, and hills and fields,
The woods or steepy mountains yields,"

which called forth from the practical Sir Walter Raleigh *The Nymph's Reply*—

"If all the world and love were young,
And truth on every shepherd's tongue,
These pleasures might my passions move,
To live with thee and be thy love."

Raleigh is second only to Shakespeare among Elizabethan lyrists.

The Character of a Happy Life, the first verse of which is

"How happy is he born or taught
That serveth not another's will;
Whose armour is his honest thought
And simple truth his utmost skill,"

was written by Sir Henry Wotton, who, when English ambassador at Venice, said, "An ambassador is an honest man sent abroad to lie for his country's good." In 1638, he was Provost of Eton College, and it was from there that he sent to Milton those letters of introduction which were of such

great use in his travels on the continent by opening to him the society of the most learned.

In the days of the ever-victorious Cromwell song was a force whose power can never rightly be gauged. Not all the chivalry and gallantry of the cavaliers could stand against the singing soldiers of the Parliament.

When the Commonwealth died, Charles II. was sung back to England and to the throne of his father by the song, said to have been written by the man who was for long his boon companion, John Wilmot, Earl of Rochester, *When the King Comes to His Own Again*, and by another, with music quite to the cavalier taste, *Here's a Health Unto His Majesty*.

Indeed, after the Restoration, secular music, which had languished during the Commonwealth, began to live so full a life that labouring men and domestic servants could read at sight. *Barbara Allen*, *Under the Greenwood Tree*, *Come Lasses and Lads*, *Here's a Health Unto His Majesty*, *May Fair* and *Only Thine* were favourite songs.

In past ages (not long past in some cases), the persecuted have been moved to successful action by the recital of their wrongs in stirring rhyme and music.

Many a despot has been hurled from place and power by song, when arms have not prevailed.

Béranger by his songs of liberty disturbed the peace of the great Napoleon, and troubled the repose of Louis XVIII. and Charles X. more than did enemies with their swords.

When James II. was endeavouring to get rid of the seven Bishops, among whom was Sir John Trelawney, a great favourite among Cornishmen, the Cornish miners commenced to march on London, and their song was, in the version of Hawker of Morwenstowe:

> "And shall Trelawney die?
> And must Trelawney die?
> Then thrice ten thousand Cornishmen
> Will know the reason why."

Their song gave expression to their fixed purpose, and when its strains reached London, the valiant James, without waiting to "reason why," made haste to the continent.

A song of nonsense verses, conjoined to a popular tune, and labelled "Lillibulero," had much to do with the turning of this king out of Ireland. Lord Wharton wrote the words, if words they can be called. But the power of the song lay in the melody, which was the work of Henry Purcell. For many years the melody was very popular, and is mentioned in the works of Shadwell, Vanbrugh and other playwrights, and by Sterne in his *Tristram Shandy*.

All that is now left of it is heard in the chorus:

"A very good song, and very well sung,
Jolly companions every one."

A man whom Charles II. delighted to honour, and with whom he was frequently seen walking arm in arm in St. James's Park, was Tom D'Urfey, who wrote the song *The Men of Kent*, in which he pays a proud compliment to those who fought so long and so bravely for Harold against William the Norman.

"Sing, Sing, in praise of Men of Kent,
So loyal, brave and free:
'Mongst Briton's race if one surpass,
A Man of Kent is he."

The fact that his master had landed at Dover on his return from exile may have prompted the work. D'Urfey also wrote a collection of songs called *Pills to Purge Melancholy*, many of them scarred and stained by coarseness and defiled by the temper of the times. There is one, however, quite free from these marks, that delicious song long known as *The Rural Dance*, now taking its name from the first line, *Come Lasses and Lads*.

Robert Herrick, vicar of Dean Prior, Devonshire, was one of the sweet lyrists of the 17th century. No one has written more prettily than he of fruit, flowers, gems, pretty women and

little children. He was a favourite at the court of the first Charles, and during the civil war and the commonwealth had to leave his country parsonage and take up his residence at Westminster, entering into the convivial life of the London taverns.

With the Restoration he returned to Devonshire at the age of seventy. He died in the same year as Milton, 1674. He wrote a multitude of verses, many of them when he was quite young. Those of a sacred character he called *Noble Numbers*; the secular are published under the title *Hesperides*. *Gather Ye Rosebuds while Ye May* is one of his best efforts, but the greatest favourite is his song *Cherry Ripe*, which has been treated so charmingly by the musician, Charles Edward Horn. This song may have been suggested to Herrick by Richard Allison's song, *There is a Garden in her Face*, two lines of which are :

"There cherries grow that none may buy
Till cherry ripe themselves do cry."

It was published in 1606.

Colonel Richard Lovelace, one of the bravest and most generous of the supporters of Charles I., has given us in his songs some lines that will live as long as our language; they are the last two lines of the following verses :

"Tell me not, sweet, I am unkind,
That from the nunnery
Of thy chaste breast and quiet mind
To war and arms I fly.

"True a new mistress now I chase
The first foe in the field,
And with a stronger faith embrace
A sword, a horse, a shield.

"Yet this inconstancy is such
As you, too, shall adore;
I could not love thee dear, so much,
Loved I not honour more."

Quite as fine is his song *To Althea*, which he wrote during the imprisonment he suffered for his gallant struggles in the cause of his king. The last verse of this song is full of high-souled philosophy and pure teaching:

"Stone walls do not a prison make,
Nor iron bars a cage;
Minds innocent and quiet take
That for a hermitage.
If I have freedom in my love,
And in my soul am free,
Angels alone that soar above
Enjoy such liberty."

Poor man! he left prison—his hopes and his heart broken, and he, who had spent a fortune in the service of his king, died, ragged and consumptive, in an alley off Shoe Lane, not far from where, rather more than one hundred years after, Thomas Chatterton, the boy poet, ended his existence by poison.

The Marquis of Montrose of whose gallant life and horribly cruel death we read in Clarendon's *History of the Great Rebellion*, has added to our minstrelsy one or two love songs of the old order, breathing a full-blown chivalry. The best known, set to very fine music, is:

"If doughty deeds my lady please,
Right soon I'll mount my steed,
And strong his arm and fast his seat
That bears frae me the meed.
I'll wear thy colours in my cap,
Thy picture next my heart,
And he that bends not to thine eyes
Shall rue it to his smart."

John Gay, the writer of pleasant fables and the author of the *Beggars' Opera* (which might have been more appropriately named *The Rogues' Opera*), gave us a song that was first favourite for many years, popular for over one hundred,

and is still occasionally sung, *Black Eyed Susan*. It gave Douglas Jerrold the title for his most successful drama, into which the song is introduced.

James Thomson, Scotland's poet of Nature, and author of the *Seasons*, wrote the song which ranks first as an expression of British patriotism, *Rule Britannia*. It was first sung at the court of George II., on August 1st, 1740, in the masque *Alfred*, which was performed in honour of the birthday of the Princess of Brunswick. The music was written by Dr. Arne.

In this year, Henry Fielding's *Roast Beef of Old England* was first sung in public, and Henry Carey, dramatist and musician, produced and sang *God Save the King*; the poetry is not worthy of him, though the music is. Carey also wrote that delightful ballad, *Sally in Our Alley*, which has charmed all ages since. Addison warmly praised it, and Gay used it in his *Beggars' Opera*. Since 1760 it has been sung to a tune called *The Country Lass* (probably Elizabethan), which very closely resembles the original music.

David Garrick, the pupil of Samuel Johnson, with whom he tramped from Lichfield to London, there becoming the greatest actor of his age, purifying the stage of much of its grossness and presenting more correctly than had been done for many years the dramas of Shakespeare, wrote what is second only to Thomson's *Rule Britannia*, as a patriotic song, *Hearts of Oak*. It was first sung in 1759, by George Champness, at Drury Lane Theatre; this was the year of the elder Pitt's greatest glory, of Hawke's naval victory at Quiberon, of Wolfe's brilliant achievement at Quebec, and of the Battle of Minden—the "wonderful year" of the second line:

> "Come cheer up my lads, 'tis to glory we steer,
> To add something more to this wonderful year;
> To honour we call you, not press you like slaves,
> For who are so free as the sons of the waves?"

This is a splendid lyric, truly patriotic, and its influence at that time of national stress it is impossible to measure. It was no less a power in England than *La Marseillaise* in France, which determined the Great Revolution, and *Die Wacht am Rhein*, which, in a great measure, decided the fortunes of war in the Franco-Prussian struggle of 1870.

Another noble and stirring lyric is *Ye Mariners of England*, written by Thomas Campbell at the time when our greatest sailor was entering on his struggle with the northern powers of the Continent. Campbell first achieved fame by his *Pleasures of Hope*, and heightened it by those fine pictures in words, *Lord Ullin's Daughter*, *Hohenlinden* (of which battle he was an eye witness), and the *Battle of the Baltic*, descriptive of the battle of Copenhagen, fought on the 10th April, 1801. In the latter engagement, the Danes, led by their Crown Prince, were defeated by Nelson, who when their ships struck sent that famous note to "the brothers of Englishmen, the Danes" (an example of his characteristic generosity) which effected a reconciliation between the two countries. Another fine song by Campbell is *Men of England*. Several lines of Campbell's have become household words, and are well known the world over, as, "Distance lends enchantment to the view," "Coming events cast their shadows before," and "Angel-visits, few and far between."

We shall never forget the hero of Trafalgar, so long as S. J. Arnold's *Death of Nelson* retains its popularity. The words are from an Opera called *The Americans*; the music is the work of John Braham, who was the finest tenor of his day. He was a Jew, his proper name being Abrahams. In his early youth he was so poor that he had to sell pencils in the streets for his living. When he died, in 1856, aged 79, he had amassed a comfortable fortune and established for his musical work a lasting popularity.

Richard Brinsley Sheridan, dramatist, theatrical manager, and statesman, who took a leading part in the impeachment of

Warren Hastings, wrote some very pretty songs, several of which are still in high favour, as *Had I a Heart for Falsehood Framed, Dried be that Tear*, and *Here's to the Maiden of Bashful Fifteen*, the last sung by Sir Harry Bumper in Act III Scene iii. of the *School for Scandal*, one of the most successful comedies ever produced.

Of Byron's songs, many of which are tinged with the misanthropy of selfishness that made him feel he was the world's victim, *Maid of Athens, ere we Part* is one of the most natural, and is certainly the most popular. Two in great contrast are *Fill the Goblet Again* and *There's not a Joy the World can Give like That it Takes Away.*

Thomas Haynes Bailey, a prolific song writer, has given us many songs merry and sad. *The Old House at Home, I am Saddest when I Sing*, and *She wore a Wreath of Roses* were great favourites for many years. The last named still has a frequent place in concert programmes.

Mrs. Felicia Hemans has done much by her verse to endear to us home and home-life, but John Howard Payne has done more than any other ballad maker to educate us in that love of home which is so fine an English characteristic. Payne, after a short experience of the American stage, came to England, and his song, *Home, Sweet Home*, was first sung in an English Opera, *Clari, the Maid of Milan*, the words of which were by Payne, and the composition and arrangement of the music by Sir Henry Bishop. Payne is said to have written the song one winter's day in 1822, when far from home and friends, a stranger in Paris. In the first year of its publication 300,000 copies of this song were sold.

Barry Cornwall (Bryan Walter Proctor), a poet of the school of Keats and Leigh Hunt, and writer of many songs, said: "Song writing is an unimportant development of Literature"; but his own songs are proof to the contrary. *The Sea, the Sea, the Open Sea*; *Hide me, Oh Twilight Air*, and others of his songs are gems of minstrelsy. His daughter, Adelaide Anne

Proctor, authoress of *Legends and Lyrics*, wrote the words of *The Lost Chord*, the music of which was composed by Sir Arthur Sullivan one night when watching by the bedside of his dying brother Frederick.

The Lass of Richmond Hill, written towards the close of the eighteenth century, has won and kept a popularity which will last as long as good music is to the taste of Englishmen. By some it is thought to have been written by a Miss Rose Smith, of Richmond, Surrey, others attribute it to Mr. Upton, who wrote many songs for the Vauxhall Gardens' concerts, amongst them *The Garden Gate* and *Remember, Love, Remember.* At first it was attributed to the Prince of Wales, afterwards George IV., but it was really the work of Leonard McNally, a barrister, playwright and singer, and the lass was Miss Janson, of Hill House, Richmond, Yorks, who was married to McNally about 1790. It was a great favourite with George III., who first heard it at Vauxhall Gardens. The music was written by the father of Theodore Hook, the novelist.

For his work as a song-writer, Charles Dibdin was granted a pension by the Government of his day. He, by his songs, did more to popularise the navy and a sailor's life than anyone (or anything) else. He wrote something like fifty songs, the power of which was mighty in attracting men to the sea service of our country in those perilous days, 1745-1815, when we needed strong arms and stout hearts behind the wooden walls of Old England. He is remembered best by *Blow high, blow low*, and *Here a Sheer Hulk Lies poor Tom Bowling.*

My Mother Bids me Bind My Hair was written by Mrs. John Hunter, wife of the famous surgeon who taught Jenner and Home, and who had doubtful transactions with body snatchers. This lady also wrote *Queen Mary's Lament.*

My Pretty Jane, which was originally published as *When the Bloom is on the Rye*, was written by Arthur Fitzball. In

his youth he lived near Newmarket, at Burwell. In the care of his father's property he had daily to pass a farmhouse the master of which had a pretty daughter. As Fitzball, whistling or singing as he walked, came opposite the house the girl would peep from behind the curtains of the window, and smilingly nod to him. One bright summer day, as he was resting on a stile close by, he wrote the words of the song. Later in life, when engaged to write songs for the management of Vauxhall Gardens, he remembered his early verse, *My Pretty Jane*, and took it to Sir Henry Bishop to set to music. Sir Henry was not satisfied with his work when done, and put it aside, but Fitzball saw the merit of the music, and said, "If this won't do, I'll write no other." It was accepted by the Gardens management, and sung there by the great tenor George Robinson, and immediately met with immense favour. It has been since sung by all tenors of the first rank. Sims Reeves had something like thirty years' successful association with it. "Pretty Jane" the farmer's daughter is said to have died of consumption; her portrait was painted by Fitzball, and is now in the possession of one of his family. The house in which she lived was burned down in the summer of 1907.

Fitzball also wrote the songs *Let me like a Soldier Fall* and *There is a Flower that Bloometh*, both of which are admirably used by Vincent Wallace in his opera *Maritana*.

Although Moore's Irish Melodies are English poems, there is in them the mixture of the smile, and the tear, the delight of passion and sentiment which marks all Irish literature. Moore's refined musical taste and his lyric eloquence have gained for his songs a world-wide favour and a place in the national collections of many countries. *The Last Rose of Summer* is as well known in Germany as in England, and is also a great favourite in Spain, Italy and France. To old familiar airs Moore wrote new words as plaintive as the music.

Wherever the air is new or an adaptation, it is the work of John Andrew Stevenson, a famous Dublin musician, in collaboration with Moore. *Oft in the Stilly Night*, *The Minstrel Boy*, *The Harp that once thro' Tara's Halls*, and *Oh, where is the slave*, are all good specimens of Moore's genius.

. . . . . .

It should be fairly clear from the above examples that songs, apart from their moral and æsthetic value, may greatly help the teaching of history and literature. It is equally possible to use them as an aid in imparting a knowledge of geography and in the study of nature.

It is not the case, however, that English song writers have lavished their poetical gifts on the natural beauties of our land or on its geographical glories to anything like the extent that the Scandinavian poets have.

Even in the new kingdoms and young principalities of the Balkans the collections of national songs are largely in praise of the natural beauties and products of the country, and this can, in a measure, be said of the older kingdoms of the continent.

It seems as if our musicians have neglected many opportunities. Surely it should be possible to find an equivalent in music to those splendid lines of Byron's in his apostrophe to the ocean, at the end of Canto 4, of *Childe Harold*, beginning, "Roll on thou deep and dark blue Ocean—roll!"

Many of our poems, charming in their beauty of description, would be more charming still with the added beauty of music. Take Browning's verse which he wrote when passing through the Straits of Gibraltar on his way to Venice, in 1838, to finish his poem *Sordello*:—

"Nobly, nobly, Cape St. Vincent to the north-west died away;
Sunset ran, one glorious blood-red, reeking into Cadiz Bay,"

describing what he saw from the deck of the ship, where, weak and ill, he stood, supported by the captain.

Many of Shelley's verses, too, might be so treated, notably this:—

"I love all thou lovest,
Spirit of delight!
The fresh earth in new leaves drest,
And the starry night:
Autumn evening and the morn
When the golden mists are born."

From Wordsworth's nature worship innumerable verses might be chosen. Milton also offers a liberal choice; several of his poems—*May Morning*, for instance—have actually been set to music by Henry Lawes, the leading musician of his time. Herrick's

"Fair daffodils, we weep to see
You haste away so soon:
As yet the early rising sun
Has not attained his noon."

Hogg's *Bird of the Wilderness*, *Blithesome and Cumberless*, and Hemans's *The Better Land*, Tennyson's *Brook*, Dickens's *The Ivy Green*, Barry Cornwall's *Oh, the Summer Night* and *The Wild Cherry Tree*, and Lady Nairne's *The Rowan Tree* have all been well treated by musicians, and several of them have the advantage of teaching a double lesson.

Among the better known songs of this class are *Softly now o'er Hill and Lea*, *Spring*, with music by Dr. Arne, *Ye Gentle Flowers*, *The First Rose of Spring*, sung to the old Welsh air "Merch Megan," and *Gather the Mistletoe*, by F. W. B. Bouverie. In this connection some hymns have a value, as *The day thou gavest*, *From Greenland's icy mountains*, and *We plough the fields*.

Songs having a geographical interest are many. *Glorious Devon* was written, I believe, for the "Society of Devonians in London." The *Song of the Southland* is a tribute to the beauties of Surrey and all the country to be seen from its hills. *Thou soft flowing Avon* and *Severn Side* honour the west.

In the song *Romantic Esk*, by Richard Gall, we find mention of Melville Castle, the Earls of Buccleuch, the river, the Pentlands, and the Braes of Woodhouselea, and in *Thou Bonnie Wood of Craigelea*, by Tannahill, the scenery is charmingly described, scenery, alas, now disfigured by the accessories of modern manufactures.

The *Canadian Boat Song* was written by Moore after an unfavourable voyage of five days down the river St. Lawrence from Kingston to Montreal. The words, which bear some resemblance to the concluding lines of Andrew Marvell's *Song of the Emigrants to Bermuda*, Moore says, "I wrote to an air our boatmen sung to us very frequently."

St. Patrick was a Gentleman is a song in which we are told that on the top of Cragh Phaidrig, a mountain of bold outline standing over the Bay of Westport, County Mayo:

> "St. Patrick preached his sarmint
> That drove the frogs into the bogs,
> And banished all the varmint."

"There is not in the wide world a valley so sweet,
As that vale in whose bosom the bright waters meet,"

was written by Moore after a visit to the beautiful country round Arklow and Rathdrum in County Wicklow, where the rivers Avon and Avoca meet. The charms of the Vale of Avoca have been proclaimed by visitors from most parts of the world, its fine beech and oak trees, its noble rocks and rivers presenting ever-changing and most delightfully impressive views.

By that Lake whose Gloomy shore is a ballad by Moore, founded on one of the many stories told of St. Kevin. Pledged to a life of celibacy, he fled to the rocks that border the Lake of Glendalough, a gloomy and romantic spot in County Wicklow, to escape the attentions of a maid deeply in love with him. Making his bed in what he thought an inaccessible spot, he slept. On awakening in the morning, he was startled

to see the maiden standing by him, and in a fury picked her up and threw her over the beetling rocks into the dark waters below. The Vale of Glendalough is famous for the most popular group of ecclesiastical ruins in Ireland—the seven churches.

The praises of Killarney are sung in a song bearing that title, and the musical bells of Shandon, near Cork, are sung by the Rev. Francis Mahoney, who wrote as "Father Prout."

The Rev. J. H. Skrine, Canon of Perth Cathedral, and writer of the Newdigate prize poem in 1870, wrote—

"Sons in my gates of the West,
Where the long tides foam in the dark of the pine
And the cornlands crowd to the dim skyline," etc.

Kipling has given us many good things in verse, and though too often his language is that of the barrack-room, and not quite suited for the class-room, much may be taught of India and its peoples and customs from his ballads, and, indeed, of other British possessions. *On the Road to Mandalay*, *With Scindia to Delhi*, and *Our Lady of the Snows* are typical.

"To the West, to the West,
To the land of the free,
Where the mighty Missouri runs down to the sea,"

was written by Charles Mackay in the "Hungry Forties," when the workless and foodless mechanics of our great cities were emigrating to lands that promised plenty. It was set to music by Henry Russell.

. . . . . .

In every phase of life, in every quarter of the globe, under every form of government, in every language, in every religion, among barbarians, pagans and the highly civilised, song has ever been one of the mightiest motive powers. By it the savage is moved to his bloody sacrifice and the Christian to deeds of charity, and love, and worship. Sailors tossing on the boundless ocean, soldiers marching under the tropical sun or

gathered round the bivouac fire, ranchmen tending their enormous flocks on the wide pastures of the Argentine, the gold miner in Africa, the seeker for rubies in Burma, the lumbermen of the backwoods of Canada, the trappers and hunters of the Far West, have all been cheered in their loneliness, have all had their rugged natures softened and their hearts refreshed by the soothing or spirit stirring power of Song.

How many a jaded, hopeless soul has been stirred to fresh effort by the hopefulness and manliness expressed in the songs of Burns, for instance:

"Is there for honest poverty wha hangs his head and a' that?
The coward slave, we pass him by, and dare be poor for a' that,
For a' that and a' that, our toil's obscure an' a' that,
The rank is but the guinea's stamp,
The man's the gowd for a' that!"

What, more encouraging, could be said for the man of low birth and iron fortune?

A song, as a literary work, cannot be too simple; by its simple expression of kindness, truth, love, heroism and beauty it reaches the masses, many of whom have neither time nor opportunity to become acquainted with prose literature. In the workshop, in the field, in the mine it lightens the burden of labour, it increases the joys of home, and diminishes its griefs.

A song in its highest form—when it breathes a lofty patriotism, when it teaches a sound morality, when it invests with sanctity the natural and instituted relations of life, and marks human duty and the good human feelings as sacred things; when it does all this in beautiful words, linked with beautiful music, it is a product of art to which there are few equals. "The poetry of earth can never die while music's golden tongue is to soulful words allied."

Song is man's most constant servant; to the weak it is a stimulant, to the forlorn it speaks hope; it fills youth with aspirations, and gladdens old age with memories of the past. Illimitable are the blessed ministries of song, the music that charms for ever.

"Nations are mortal,
Fragile is greatness;
Fortune may fly thee,
Song shall not fly.

"Song is the potion
All things renewing,
Youth's one elixir
Fountain of morn."

WILLIAM WATSON.

(T. W. G.)

CHAPTER X.

Expressional Subjects—School Gardens.

THE preceding chapters have dealt mainly with "knowledge" subjects. Now there are many educationists, and some *pseudo*-educationists, who believe that too much stress has, in years gone by, been placed on conferring knowledge. They imagine that somewhere in the mind there is a sort of "knowledge" faculty (probably they would call it a "memory" faculty), and somewhere else a "will" faculty, or a "power" faculty, and that teachers have forgotten the latter while cultivating the former. Accordingly these reformers have commenced a campaign by inscribing on their banners such mottoes as "Don't cram with facts," "Don't burden the memory," "Don't give mere bookish knowledge," and occasionally by proclaiming the more positive and encouraging doctrine of "Learning by Doing."

Knowledge v. Power or Skill.

Now this controversy seems to have been transferred to the pedagogical from the theological realm, where, taking the form of "Faith *versus* Works," it was adequately settled (one would have thought) by St. James. "A man may say, Thou hast faith and I have works: show me thy faith without thy works, and I will show thee my faith by my works. . . . Faith without works is dead."* Translated into pedagogical language, this would read, "A man may say, Thou hast knowledge and I have skill (or power): show me thy knowledge without thy skill, and I will

* *James ii.*, 18-20.

show thee my knowledge by my skill. Knowledge without skill is dead." In other words, genuine knowledge and genuine skill must go together, though a verbal, fictitious, dilletantish "knowledge" may exist without skill, and a blind, mechanical, unprogressive skill may exist without knowledge. This applies not merely to one subject of the curriculum, but to all; not only to manual subjects, but to the most abstract. If a boy is unable to draw a water-jug from memory, his inability must be due to lack of knowledge, either visual or motor. We can use "faculty" phraseology if we like, and say that he has neglected his "faculty of observation" (he has not "observed" the jug well); or his "faculty of exactness" (he has not sufficient motor knowledge to control his pencil); but a more generally helpful way is to speak of the connection between "impression" and "expression." But is it true to say that "*Knowledge is power*"? Surely it is! A man's "knowledge" of history must be very poor, very verbal, very fictitious, if, when standing outside a Norman castle or reading an historical novel, he has no "power" over the materials he is contemplating—no grasp of them, no sense of acquaintance. *Real knowledge, then, is real power.* And this even holds good of morals. The confirmed thief may be said, by the common man, to "know" what is right, and certainly he does *know* in a verbal, outward sort of way; but the more deeply I reflect upon the matter the more convinced I am that moral evil is closely linked with "invincible" or almost invincible "ignorance," with inability to *see* the evil in its real and vivid colours, with inability to "apperceive." "He does not *know* what honesty means." *Real, apperceptive knowledge is real executive power.*

Real Knowledge is Real Power.

The preceding chapters have been concerned mainly with "knowledge" (impression). But the observant reader will have noted that in those chapters there was a constant tendency to wander away from the subject of knowledge to the

subject of action; from "impression" to "expression." For example, recitation was dealt with in connection with literature, map-drawing in connection with geography, and the preceding chapter on songs combines so flagrantly the expressional with the impressional side of education that I feel much doubt whether it should not be postponed to a later part of the book. It is probably the expressional aspect of educational work that will need special emphasis in years to come. To give a boy ideas is well—indispensable, indeed; but if the ideas are to be of much efficacy and permanence they will have to be expressed. They may merely serve in the apperception of other ideas—going out to meet and interpret them. That is good. But in many cases they will lead him to engage in constructive work of some kind; the "inner" and the "outer" (as Fröbel once said) will be in a constant state of interaction; "interest," as Herbart said, "is self activity."

Two Golden Rules.

"*Make your 'knowledge' subjects practical; make your pupils apply their knowledge*"—this is one of the sovereign rules of the new education, and is of especial value to teachers who, while fond of books and full of knowledge, are lacking in motor interests. "*Make your teaching of skill significant; make your pupils appreciate and apperceive what they are doing*"—this is the converse rule for those teachers (manual and other) whose interests are mainly motor.

Mr. Squeers, in a flash of pedagogical illumination, made a boy work in the garden after spelling the word b-o-t-t-i-n-n-e-y ("a knowledge of plants"). And modern education must not only find a place for "nature study," but for "school gardens" also. Whosoever has a love of nature will want to control nature; his ideas will pass into action; "impression" will give rise to "expression"; his "knowledge" will become "power." The paragraphs and chapters that follow deal mainly with some of the means by which this desirable consummation may be attained.

It may be that in years to come a far more revolutionary standpoint may be taken up. Instead of regarding "knowledge" and "skill" as partners, the former may be regarded as a subordinate to the latter. In schemes of school work outlined by such advanced educationists as Professor Dewey, this tendency may be detected; a series of practical occupations or pursuits are to form the centre of the school work, and the acquisition of knowledge is to be regarded as subsidiary and incidental to these pursuits. No doubt in the early stages of racial development, knowledge was mainly regarded from its practical side; the stars were studied in so far as they helped the traveller; plants were studied in so far as they were directly useful or injurious to men; geometry was studied as a means of mapping out estates after the flood of the Nile valley had subsided. There are historical precedents, therefore, for subordinating knowledge to practice, and it is repeatedly said, by "practical" men, that the best knowledge is that which we "pick up." But I am not convinced that all knowledge should be so subordinated, though I am quite convinced that we should "apply" our knowledge in all sorts of ways if we want it to be as real, copious, permanent, and valuable as possible. And now for the practical side of "bottinney."

A Future Revolution?

(F.H.H.)

SCHOOL GARDENS.

School gardening has made phenomenal progress during the last few years, notably in such counties as Surrey, Suffolk, Gloucester, Hertford and Kent.

The work presents irresistible attractions to those lads who are sufficiently fortunate to be included in the gardening class. They are delighted to handle the tools, sow the seed, watch the growth of a plant, feed, train, protect, and take pride in it. This close contact with Nature re-acts strongly and

The Secret of Success.

wholesomely upon boys. Flowers, birds, frogs, toads and insects are carefully noted, recognised, and, if need be, protected. The same intensity of interest is apparent in manual training centres, where the ordinarily "dull" boy may often be noticed working with unexpected application, intelligence and success.

Domestic economy centres produce the same surprising results. Girls enjoy the roasting, stewing, boiling and baking in the cookery class; the washing, ironing and starching of the laundry-work centre; the dusting, polishing and bed-making of the housewifery class. In all these cases brain, eyes, fingers and feet are actively employed, and the child is supremely happy.

Scope of Article.

In a very limited space prominence must necessarily be given to such general measures as may enable teachers to initiate successfully a school gardening class. Detailed information regarding the daily routine of work may be obtained from the many and admirable publications bearing upon the subject. It is hoped that many teachers may be induced to take up this subject, as well in urban as in rural schools. To this end hints are given respecting flower borders, school flower shows, window boxes, decoration of school rooms, etc., on the assumption that many who are unable to aspire to a vegetable and fruit garden, may still desire to enhance the attraction of their schools in some one of these ways.

Code Regulations.

The Government "Code of Regulations" must be consulted as to the conditions governing the recognition of a school gardening class. Amongst other matters to be taken into account are the size of a class, number of classes, age of pupils, hours of employment, qualifications of the teacher, duration of the course, and supervision.

As in manual training and domestic science, so in school gardening, the services of a trained teacher are of inestimable

value. The utmost success and pleasure may be anticipated by the head or assistant master who possesses the requisite knowledge of, and enthusiasm for, the subject, and is at liberty to undertake the superintendence of the class. This ensures a minimum of expense, proper discipline, and a novel and healthy feeling of comradeship between the master and his pupils. In many counties teachers are able to avail themselves of the advice and wide experience of organisers and instructors employed by education authorities. Thus may be settled the proper rotation of crops for a particular locality.

Supervision.

Rural schools would possibly have the advantage of a plot of ground near to, or adjoining the building. In urban districts recourse may be had to neighbouring allotments. Many authorities rent such portions of ground for the formation of gardening classes. As a rule, landowners in the district are entirely in sympathy with the teaching of this subject, and would generally be willing to facilitate the acquisition of sites for the purpose at a nominal rent.

Site and Size of Plots.

The size of the garden must be determined by the amount of land available, the number of classes to be formed, and the extent of each pupil's plot. According to Government returns one rod of land would appear to be sufficient for each scholar. Other methods, however, obtain in some counties—a plot of two rods is cultivated by two pupils, or the class works upon a large common plot—each system claiming special advantages.

A shed of some kind will be necessary, especially when the garden is situated far from the school. Where strict economy is imperative, a complete set of the commoner tools for each boy need not be supplied. One fork or spade will suffice for the work of two boys. For a list of accessories required see any recent publication on school gardening. Such small articles as hooks, nails, labels, and

Garden Tools.

boxes should find a place in the shed, together with shelves for packets of seeds, fertilisers, etc. No tool should be stored in a dirty condition.

Preliminary Operations.

Rough land, especially pasture, will entail labour too arduous, as a rule, for the young folk, and should to some extent be prepared for use by adult labour. Trenching and manuring will follow, and, should the land be infested with wireworms, a coating of gas lime must be applied. The garden will then be marked out in oblong plots, and if left to the action of wintry weather, the frost, snow and rain will exercise a beneficial effect upon the texture of the soil.

Manures.

An approved rotation of crops, together with an application of farmyard or artificial manures, will ensure a supply of plant food throughout the season. For very light soils short farmyard manure, and the droppings from pig-sties and cow-sheds are valuable, while heavy lands should be supplied with the longer manure from the stables. In rural schools it should not be very difficult to obtain manure from neighbouring farms or mansions. Teachers in urban schools will pay court to the local greengrocer, coal merchant, or doctor. The dust contractor may generally be relied upon for a few loads of road sweepings, those from flint-made roads being preferable. All litter should be burnt on the garden, and the ashes distributed and forked in. Soot and lime have valuable properties, as well in destroying insect life as in yielding plant food, and acting beneficially upon the constituents of the soil. Gardens near the sea will greatly benefit by the addition of seaweed, a substance rich in nitrogenous and mineral matter. Artificial fertilisers, such as nitrates, sulphates and phosphates, will in most cases prove too expensive for the school garden. A little may be bought for demonstration purposes, and for use in the flower borders and window boxes, as well as for potted plants.

In many counties teachers will requisition their supplies from the central authorities. In other cases, local nurserymen will prove more reliable than strangers. Seeds should be bought in small packets, and sown very thinly—peas and beans, however, will be bought by the pint or quart.

Seeds and Plants.

The following is extracted from a lad's note-book, and represents a method of utilising time during unfavourable weather.

The Note-book.

THE GARDEN PEA (*Pisum Sativum*).

KINDS ...	All "pod" plants are called legumes. *Early*—Gradus, 1½ ft. March. *Medium*—Sharpe's Queen, 3½ ft. April. *Late*—Autocrat, 5½ ft. May.
SOWING ...	Trench 1 ft. to 1½ ft. Manure and cover with soil. Draw drills 3 in. deep, 3, 4 and 5 ft. apart, according to kind. If early kind is sown in autumn, dip in red lead or paraffin, and sow more thickly.
MANAGEMENT.	Use pea guards or black cotton. Sprinkle soot. Water roots, not foliage. For support, use stick, string, or netting. Earth up or mulch. Use two hands when picking.

Note.—Sticks should be collected in winter and early spring.

Among crops suitable for school gardens may be mentioned peas, broad beans, scarlet runners, dwarf beans, carrots, beet, lettuces, cabbages, cauliflowers, broccoli, kale, Brussels sprouts, savoy, turnips, celery, onions, potatoes, and herbs. Plants requiring much

Crops to be Grown.

room, such as marrows and horseradish, may be grown on a separate, common plot.

Flower Borders.

Many schools, even in urban districts, may find it possible to have a flower border round the playground. At the back may be grown tall plants, such as the sweet pea, sunflower, dahlia, hollyhock, lupin, chrysanthemum, and ox-eyed daisy. In the centre, the wall-flower, Sweet William, Canterbury bell, Brompton stock, gaillardia, anemone, and columbine. In front, the pink, pansy, polyanthus, pyrethrum, double daisy, thrift, London pride, primrose, and auricula.

Window Boxes.

Suitable plants for window boxes are the snowdrop, crocus, tulip, narcissus, hyacinth, Marguerite, fuchsia, geranium, Creeping Jenny, ivy, stock, aster, mignonette.

An Urban Flower Show.

In the very poorest parts of London, where school gardens are out of the question, much can be done to encourage a love of plant life. The most popular method seems to be the flower show. The following is the method of organising a Children's Flower Show in a London Council School situated in a poor neighbourhood:—

1. *Plants from Seeds.*—Six different kinds of annuals are sold to the pupils at ½d. per packet, and are bought from dealers at 2s. 6d. per 100 packets. These, 1200 in number, are distributed in February. The plants are grown at home and exhibited at the school show in July. Three silver medals are awarded, and in addition two prizes for the best in each kind of flower.

2. *Plants not raised from Seeds.*—These are arranged in three classes:—

(*a*) First Class.—Those purchased at the school, *viz.*, geranium, fuchsia, petunia, calceolaria, begonia, fern. These are sold at 2d., and purchased at 1s. 6d. per dozen, the dealer paying half the cost of carriage Prizes are awarded in

proportion to the number of entries. These plants alone may compete for the Silver Challenge Cup.

(*b*) SECOND CLASS.—Plants exhibited in any previous show. This encourages children to take a continued interest in their plants.

(*c*) THIRD CLASS.—Plants purchased, or otherwise procured. Children and parents are thus encouraged to beautify their homes. The least valuable prizes are awarded in this class.

Funds are raised by means of profit on the sale of seeds and plants, donations, sale of gifts of cut flowers, and by the sale of admission tickets. To ensure honesty, a piece of tape, colour varying to indicate kind of plant, is tied around each stem (Class II., *a*, *b*). A small piece of parchment is attached by sealing-wax, and stamped with the seal of the show*.

(H. P.)

* If space permitted much could be said upon the intimate connection of this subject with Manual Training (see Chapter XII.); a little school commonwealth, with "communal" occupations, could indeed be erected on their basis; wooden implements (fences, etc.) for the garden (or the "open air school") could, for example, be made in the manual training shed. The boy will not only *read* Robinson Crusoe but will *act* him.—(*Suggested*, H. W. S.).

CHAPTER XI.

The Teaching of Drawing.

THE place of Drawing in the curriculum of our school was historically decided when Paleolithic man scratched the first rude forms on horn or bone with his flint tool. "All art," as Walter Crane writes, "is primarily the projection or precipitation in material form of man's emotional and intellectual nature." These crude drawings of primitive man probably satisfied his natural craving to record something of what he saw around him; and, as the claims of appetite formed his chief interest, deer is the first conception which he attempts to express in simple outline. But, with his power to appreciate form came the discovery that he could control it and stamp his ideas upon the material world around him. To satisfy hunger he must kill, and to kill he must shape himself a weapon, and this thought was projected into the stone axe or flint arrowhead.

Art a Record of Ideas.

Thus began that permanent record of the life and ideals of mankind, which may be found in the rude attempts of the cave dwellers, the pavements of the Assyrian builders, the frieze of the Parthenon, the mural decorations of mediæval Italy, or the walls of our modern Academy. For pictorial art did not long content itself with an expression in bare outline: colour, and the play of light and shade by which the full beauty of nature is revealed to us, soon claimed man's attention; and with the power to see grew the power to add these new glories. The ideas of beauty conceived by the race expanded and invaded realms where hitherto utility had mainly prevailed;

the craftsman's control over his materials was gradually increasing, and he could now care for other things than mere use. In this way the paleolithic axe grew into the flashing splendour of the Damascene sword. Thus arose the desire to make beautiful buildings, and, with the centuries, the power to develop the architecture of the wooden or stone lintel into the arched glory of the Gothic cathedral. The higher cravings found expression in every direction, and clothing, furniture and domestic utensils, as well as painting and sculpture, expanded with man's growth, and were stamped with his art.

The Art Craving of the Child.

As with the race, so with the individual. Watch the first attempts of the infant to express something of the life which is unfolding itself. Notice the delight with which it recognises in the toy animal or dolly an expression of the beings which come within its circle of interest, and the pride it shows in breaking up its biscuit, or crumpling up a piece of paper, thus exhibiting its newly found power to control form. Herein is the germ of art, and, when the discovery is made later that the pencil will express much that has hitherto vainly struggled for expression, that colour may be reproduced in paint, and that sand may be built into castles, the art training of the child has begun. Hereafter the "inner force" will "out" in material form, be it the crayon drawing or plasticine play model of the more fortunate child, or the pavement sketch or mud pie of the slum.

The natural art outlets of the child are a part of its very existence, and as such are carried as far as its powers allow. I have watched a little girl commence with the outline drawing of a figure—always the most attractive study with children. Soon the colour-box was requisitioned to add a touch to the hair, the cheeks, and the frock. The scissors were next brought into play, and the figure cut out to look more real. The final touches showed that the stage of reality had been reached, for a scrap of silk was tied around the waist

for a sash, and a paper hat was cut out, trimmed with scraps, and fitted to the head. No wonder that the same child poured tea into the cup that she had modelled, and put her plasticine mushroom in front of the fire to cook. These touches showed that her creations were cherished as part of the real life about her.

Art Life of the School.

It is now recognised that these "play impulses" are closely akin to "art impulses," and that the function of the school is to enlist these natural desires of the child in the service of education, and to develop, as fully as possible, all its powers of active expression. The greatest reproach against our teaching in the past has been its neglect of this side of the child's life; for, until recently, the restricted use of drawing was not calculated to stimulate or develop it.

A large conception of such training should include every active expression of the child; not alone its creations on paper with chalk, pencil, pen, or brush, but the varied occupations of the infant school, the flower making and mat-weaving of the special school, the modelling which should pervade every department of every school, the needlework and lace-making of the girls' school, and the cardboard, wood, or metal work of the boys' school. The intimate and inseparable connection of these subjects must be constantly borne in mind, and every effort made to correlate them properly. We must therefore regard the particular branch dealt with in this chapter as merely a contribution to a much larger question.

History of Drawing as a Factor in Education.

The organised teaching of Drawing is modern, and the idea that such training must form an integral part of a child's equipment has only quite recently been acknowledged. One need not go back many years to recall school prospectuses in which Drawing figured as an "extra," a mere accomplishment, lying outside the pale of a "sound education."

Yet four hundred years ago, Rabelais, in his education of Gargantua, "studied the arts of painting and carving," thus recognising the value of art training in early education. Mulcaster insisted that "the hand, the ear, the eye, these be the greatest instruments," and, had his dictum been accepted, the teaching of centuries would have been revolutionised. Comenius, a hundred years later, pleaded for "occupations for mind and hand," and "would have *objects* drawn, correctly or otherwise, provided that they afforded delight to the mind." Jean Jacques Rousseau went still further, and required drawing, "not exactly for the art itself, but to make eye correct and hand supple"; but he would keep Émile "clear of the ordinary drawing master, who would put him to *imitate imitations*; he was always to draw from the objects, not so much to imitate them as to get to *know* them." Naturally, Pestalozzi endorsed this view and showed that by "learning to draw from nature we perceived many circumstances commonly overlooked," moreover that "the attention to the exact shape of the whole and the proportion of the parts which is requisite for the taking of an adequate sketch is converted into a habit, and becomes productive both of instruction and amusement." It appears to have been left to Fröbel, however, to discover that the natural activities of children impelled them to draw and express themselves in the concrete, for he noted that they "endeavoured to imitate known forms by drawing, or, whenever they could get any plastic material, by modelling them"—pregnant discoveries, of which the modern school should take full advantage.

After reading these extracts one can hardly realise the blindness that dictated the kind of Drawing fostered for so many years by the State Department of Education,—the eternal round of the conventional freehand copy and the deadly monotony of the ruled abortion. Unfortunately, the tradition of these still lingers in our schools; some few teachers have not yet emancipated themselves from it, and others are

enslaved by the examining bodies that still require such tests from the children.

Aims and Principles of Drawing-Teaching.

It is now realised that, in our schools, we do not teach Drawing and its cognate subjects to make of necessity either artists or craftsmen, but to train the mind through the eye and the hand, and thus to help forward the general education of the child. Nor do we regard Drawing as a mere accomplishment or an accidental gift, the possession of the few. Like speaking and writing, it is a means of expression, and therefore a necessary factor in all true education. Moreover, it is one in which children naturally delight, and may even be said to rival both speaking and writing as a vehicle of thought; for does not the picture often convey more to the child than the written or spoken word, and will not the chalk often give forth more of the nature lesson than either tongue or pen? Even the language of the scientist fails to compete with the child who, pencil in hand, describes a leaf by "It looks like this!" As a method of expression it is facile and exact, and, as the world owes much to its great artists, so the school should owe much to the great teachers who have given art its true place in the curriculum.

The chief aim of the drawing lesson is to cultivate the power to read and write truthfully form and its accessories.

1. Truth of Conception and Expression.

From the beginning the child must be trained to see truly and to express faithfully, and this steady search for truth must be continued throughout his school life. Incorrect, or incomplete, mental images are fatal to all exact thinking, and it should be one of the chief functions of the drawing lesson to correct and complete these images. Accurate observation is the first condition of correct delineation, but the one reacts upon the other, for, in attempting to reproduce we realise how imperfectly we have perceived, and are urged to closer attention.

The observing powers of children are naturally limited, and much impatience will be spared if the teacher will but recognise that they are often physically incapable of seeing much that they are expected to draw. The power to visualise completely even a simple object comes but slowly. Children will recognise that an apple, an orange, and a tomato, are "round," will notice the difference of colour, may even observe that one has a stalk and another a dead calyx—for children love unimportant detail, and often notice what an adult would miss—but their observation has not been sufficiently exact to lead to an appreciation of the broad differences of form, which alone will make each fruit recognisable. The attempt to express, however, has been a Socratic process, and the state of ignorance which it has revealed will probably create a desire for closer observation in the future. Not only will incomplete impressions be realised, but faulty notions may become so glaringly apparent, in black and white, that they will sometimes be automatically corrected by the children.

Some child-study enthusiasts therefore go so far as to suggest that the teacher should abdicate, and the child be left to observe and draw, and discover and correct, without interference. The idea is not without value, but is obviously extravagant. Certain children would probably learn much, but the majority would flounder aimlessly. Besides, there is always a tendency for the wrongly-drawn image to substitute itself in the child's mind for the right one.

Hence it is the province of the teacher to give legitimate aid to the observing powers and to teach the child not only to *look* but to *see*; to call attention, for example, to the importance of the mass and the comparative unimportance of certain details; to anticipate and prevent mistakes where possible; and to correct faulty observation and expression where it would otherwise remain uncorrected. Doubtless the line of least interference is the safest, but instruction is, and always will be necessary, and "the go as you please" method,

which has failed in America, we may leave to the educational crank.

Kipling sings:—

"But each for the joy of working, and each in his separate star,
Shall draw the Thing as he sees It, for the God of Things as they Are."

But "seeing" is one thing and "seeing *correctly*" is another; and the child must be taught to see the thing as he *should* see it, and be helped to draw it as faithfully as his powers allow.

2. Training of the Æsthetic Sense.

To the search for truth must be added the search for beauty, and some training of an æsthetic kind must be regarded as the second great aim of the drawing lesson. It is refreshing to read in the *Suggestions to Teachers* that "the feeling for beauty should be cherished and treated as a serious school matter, it cannot be left to chance or caprice." Too often the child's natural love of the beautiful receives little stimulus from its smoky and sordid surroundings. It must be one of the functions of the school therefore to see that "Some shape of beauty moves away the pall from their dark spirits." * This refining influence must be kept alive and directed into channels of real interest.

The æsthetic sense in its crudest form is a mere feeling of pleasure at some brilliant effects of light or colour, but gradually less vivid stimulation is required, and quieter and more unobtrusive charms prevail. The nature study lesson has now done something to disclose the deeper significance and richer suggestion of nature; and foliage and flower, butterfly and bird, feather and shell, may now be made to reveal their beauty of form, of colour, of contour, and of texture. Simple standards of beauty may be gradually

* In this connection the student is advised to read the whole of Keats's lines on beauty at the beginning of *Endymion*.

set up, and æsthetic judgment, or taste, developed. The conception of ornament from nature may be made apparent; the proportion of the forms studied, the harmony of their colouring understood, and rules deduced from the radiation of the leaf or the symmetry of the shell. Time may even be spared to show the possibilities inherent in this curve or that natural object. The grandeur of the Corinthian capital was suggested to the beauty-loving Greek by a humble acanthus growing from a broken pot.

Such training must entirely depend upon the individuality and power of the teacher, and much of it implies the presence of a specialist on the staff. In all cases, however, the silent influence of beautiful environment may be allowed to do its work. Thus the decoration of the school, the pictures on the walls, the furniture in the room, and the many objects with which we surround the children, must be chosen to aid the formation of good taste. Modern conditions will certainly doom the majority to the dingy life of the town, and it becomes imperative for their social and moral well-being* to instil a love for dainty surroundings, a true interest in pictures and sculpture, and an intelligent appreciation of architecture and ornament—one that shall enrich their lives, and add a fuller, deeper meaning to the works of man as well as to the glories of nature.

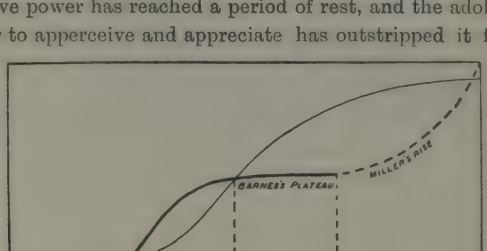
In this connection may I plead that in large towns boys should be taught, chiefly by the aid of the lantern lesson, sufficient of the elements of architecture to enable them to take a real interest in the buildings among which their lives will be spent, and which are often quite meaningless to them. Most modern cities present a wealth of architecture, which might afford the observant lad a field of wonder and delight, that should brighten the dullness of the daily round and give a new meaning to brick and stone. We conduct nature study

* As Ruskin says: "The mind that seeks the beautiful is on its way to become a beautiful mind."

lessons when his opportunities for it are few and far between, but we let him daily walk blindly and ignorantly among buildings, rich with inspiration and suggestion.

Again, art galleries exist in most large towns, but to many children in our elementary schools a picture is something on the hoardings, or in the illustrated papers—often of the baser sort. Yet inside doors, which they have never ventured to open, lies that world of beauty and romance for which they hunger, and with which they should be fed. Visits to such places should not only be permitted, but should be distinctly encouraged. Let those who cry out that time cannot be spared from the ordinary work of the school remember that a visit to an art gallery will be a living memory and power for good, long after many hours of formal teaching are forgotten.*

This feeding of the receptive imagination is particularly necessary during the latter period of school life, when the creative power has reached a period of rest, and the adolescent power to apperceive and appreciate has outstripped it further



Motor, creative, or productive power.
Sensory or receptive interest in the finished product.

than it will again do in life. This period of rest may be seen at Barnes's plateau in the diagram taken from Pro-

* A word of warning must here be given: To *tell* a child that this or that is beautiful will only lead to cant. On returning from an exhibition recently, a little girl remarked on "the beautiful Madonna" she had seen. The conversation that ensued showed that her real interest was in the pictures which she understood, and that her admiration for the old master was pure affectation—the result of something she had been told.

fessor Stanley Hall's book, from which we quote: "At the dawn of this stage of appreciation the æsthetic tastes should be stimulated by exposure to, and instructed in feeling for, the subject-matter of master-pieces; and instruction in technique, detail, criticism and learned discrimination of schools of painting should be given intermittently. Art should not now be for art's sake, but for the sake of feeling and character, life and conduct; it should be adjunct to morals, history and literature, and in all edification should be the goal."

3. Cultivation of the Imagination.

Much of this is closely allied to our third great aim—the cultivation of a circle of thought which shall develop powers of invention and discovery. The age of childhood has been termed the golden age of the imagination, and these golden hours must be used to develop the creative imagination as well as to aid the power of reproduction. The inventive faculty depends largely upon true visualisation, for clear-cut mental images are the materials from which new concepts are formed. Our art teaching must therefore strive not only to provide a store of these clarified images, but must foster the power of combining them to form others. Immediately we gain a clear impression of some perfect form, we perceive that two or three similar forms will combine to give a new one, and our natural activity impels us to the creation of such. Herein lies the true value of the simple design lesson, which should not be a blind groping along unseen ways for an artistic creation existing only in the mind of the master,* but should satisfy the craving of the child to conceive and produce something new from the materials at his disposal. Though the result may shock every artistic instinct of the teacher, "a poor thing, but mine own," is of more value than the most perfectly conceived production, the meaning and pur-

* Such as the wonderful designs that could be seen a few years ago at the Exhibitions of Drawing held by the late London School Board.

pose of which is unknown to the doer. Besides, by sympathetic criticism the crudest attempt may be made to lead to something better.

Similar exercise is afforded by the memory drawing lesson, which involves the recollection and fusion of several mind images into a product which the child has already recognised. The mental value of such a process may well give to the Drawing lesson an enhanced value, based as it is on the child's natural love of imagination and invention.

4. Cultivation of Dexterity.

The cultivation of dexterity may be described as the utilitarian aim of the Drawing lesson. The love of free movement must be harnessed, and the child must be taught to acquire movements that shall make the language of the hand possible. The young child has little control over the smaller and finer nerves and muscles; delicate movements must therefore not be expected at first. Hence the large chalk drawing, allowing free play for the arm, is recognised as the most suitable form of Drawing for the infant school. But as the motor muscles come more under control, the subtler handling of the pencil must be acquired, the almost dangerous mobility of the brush must be conquered, the fluent and expressive pen mastered, and the ruler, set-square, and compass brought under control. Above all, the manipulation of plastic material must form a continuous part of every course, and should lead to other manual occupations, dealt with elsewhere, which have dexterity as their chief aim. It is imperative that the skill here outlined should be obtained during school life, for authorities now agree that this is the period during which the hand centres of the brain are most active.

To sum up the foregoing, it may be said that drawing aims at truth of conception and expression, love of beauty, facility in invention, and training in dexterity. Its use in the correlation of other studies must not, however, be forgotten. Herbart places it as the link between the humanities and

the sciences. All will agree that it must lead up to and accompany all manual occupations. Nature study and science lessons cannot proceed far without it, and its use in these directions is generally recognised. But there are other school subjects from which it is too often entirely divorced. Opportunity for its use may often be afforded in the composition lesson, and the delight with which children will illustrate suitable subjects, and the pains they will take to collect the necessary material, will amply repay anyone who tries the experiment. Give a hint, for example, that the next subject for an essay will be "hats," "cooking utensils," "cricketing apparatus," or some similar subject affording a variety of simple illustrations, and the teacher will find not only a ready supply of sketches, but a ready flow of language suggested by them. Pass on to the illustration of a scene from a story, and a freshness of idea and facility of expression will be found, which, though crude, will none the less surprise.

Drawing as a means of Correlation.

The history lesson offers a natural field for the use of drawing, and a living interest in the people of a period may be stimulated by the thoughts involved in drawing the weapons with which they fought, the curious articles of dress they wore, or the coins they used. A fine concrete illustration of the great forces at work in a country may be found in the buildings which permanently record the power of the builders. The condition of feudal England may be best comprehended by some knowledge of the baronial castle, perched on the hill-top, its massive proportions dominating the surrounding country, and forming alike an object of terror, and a harbour of refuge, for the serfs in the hovels around. The wealth and power of the Church may be most vividly shown by the magnificence of her cathedrals, and the size and richness of her monasteries.

In the geography lesson drawing should not be limited to maps and diagrams, but the children should be encouraged to make sketches of the peculiar flora or fauna of the country, of

its dwellings, its implements of husbandry—anything that will bring home the salient characteristics of the land or its inhabitants. Ten minutes spent in sketching a Zulu kraal or an assegai will develop a circle of interest in that race that will be most valuble in giving a zest for further knowledge. Architecture will again be found a valuable aid, and much may be learnt by comparing the temples of Egypt and Greece, the cathedrals of mediæval times, and the sky-scrapers of America. The modelling of relief maps will also form a part of every well co-ordinated scheme.

Extensions into other subjects will occur to the thoughtful teacher; and to those who object—with much reason—that the formal lesson allows no time for many of these excursions, may I suggest that, with encouragement, children will readily regard much of this work as recreative, and will willingly do it at home, thus developing a self-reliance and power of research which in themselves are valuable.

Before proceeding to further consideration of the formal drawing lesson, it will be necessary to realise clearly the means by which things are made manifest to us. Form of itself is non-existent, and can only be realised in matter. It is simplest when presented to us in only two dimensions, as in a copy or on a blackboard. The third dimension, which gives solidity, introduces not only complex perspective effects, but the mystery of the hidden and partly-hidden lines and faces. Solidity is realised by experience, the nature of which will be dealt with later.

Form and its Attributes.

Material is made manifest to the eye only in the presence of light, the quantity of which may vary from a brilliancy which dazzles, through an infinity of degrees, to the minimum perceptible, which may be regarded as practically black. Such light is seldom distributed equally over the different surfaces of a body, and, under ordinary circumstances, the varying con

ditions of light and shade largely determine the appearance of an object.

Material is usually illumined by colour, which also falls into a series of gradations, passing from one extremity of the spectrum to the other, and varying under different aspects. It also possesses a surface form or texture, appreciated first by touch, and recognised later by the light and shade effects upon its surface.

In completely representing form, therefore, we are also concerned with its attributes of colour, light and shade, and texture.

Apprehension of Form.

The active processes by means of which we apprehend form and gain perceptions of space, extension and solidity, are centred in the senses of touch and sight, and are accompanied by movement. We learn to judge the distance of an object by traversing the space separating it from us. We gain ideas of its size and shape by noting the muscular sensations experienced in approaching it, and by active tactual and visual examination on arrival. We realise its solidity by passing our hands over its surfaces, by regarding it from different positions, and by noting the accompanying variations of appearance, light and shade, and perspective.

Sight is, however, the leading avenue of perception, for by its use we gradually learn to interpret the more elementary experiences gained by touch and movement. Such impressions are the chief province of the drawing lesson, but it will occasionally be necessary to revive and clarify them by further tactual examination. For although complete knowledge of an object is not always necessary for a single representation of it, yet it changes with every movement, and ability to draw it should not be claimed until it can be reproduced in any aspect, a task which pre-supposes perfect apprehension.

The Teaching of Proportion.

The relation of the different parts to the whole and to each other constitutes the study of Proportion, and the correct shape of an object can be reproduced only when such proportion is duly maintained. The logical method of attaining this end is to grasp the large and essential forms, and then to add the less important; or, as the nigger ditty aptly suggests:

> "First draw de monkey,
> Den draw de tail."

This is not, however, the method which finds favour with the child, and it will be well, at this stage, to examine some of the hindrances to a true realisation of proportion.

Although the essential form of an object is of primary importance, it is often of least importance to the child, who will not only first draw the part that best pleases him, but will give undue prominence to it. The wart on Cromwell's nose possesses greater attraction than the relative size of that organ. The human figure is drawn "all head and no body" because the head presents more interest, the arms and legs coming next, and the trunk being a mere encumbrance. For the same reason, the main contour of a map is often sacrificed to some particular feature of the coastline (a bay, or headland), which attracts.

Secondly, children prefer to be independent of the model, and to draw from fragmentary impressions, even with the object before them. This tendency to draw from faulty notions rather than from careful observation is not limited to children; you may recall the life class in Mr. Zangwill's *The Master*, at work on a three-fingered figure, and conscientiously drawing the four fingers of the conventional model.

Another obstacle is a rooted objection which children possess to leaving out any detail of their subject. If they draw a man in a boat, or a cart, they must show the hidden legs. They will wriggle about in the desk in a vain endeavour

to see the handle of a jug which may be turned away from them.

Lastly, they object to drawing detail in an unfamiliar position, and are quite unhappy if the handle of the jug appears "end on," and they are not allowed to make it jut out from the side outline of their drawing, as they know it to jut out from the object.

The teacher may anticipate such mistakes, and help to prevent them by some preliminary analysis and demonstration, without unduly interfering with the personal observation of the children. The cumbrous method of securing good proportion by erecting an elaborate scaffolding, calculated to destroy all freedom and judgment, must be absolutely discarded. The balanced conventional copy lent itself to such abuse, but the process is unfortunately outliving the copy. Certain preliminary measurements will always be necessary; or instance, the true relation between the width and the height must be established as the first condition of true proportion, and due regard must be had to the tasteful filling of the space. The measurements to secure these requirements should first be performed by the eye, but may afterwards be confirmed by holding the pencil, at arm's length, between the eye and the object; but such mechanical aid should be reduced to a minimum, and the eye should in time prove superior to the rough approximations thus obtained.

All good teaching in proportion should require an intelligent use of leading lines, and should favour a rough "blocking out" of the larger masses of form to indicate their relative size and position. Criticism is of most value at this stage, as it is here that the success or failure of the drawing is sealed.

Many teachers, in their desire to show correct methods of attacking a subject, have required their pupils to follow painfully, step by step, and line by line, their own efforts on the blackboard. Nothing more calculated to destroy the real interest of the children in their work could be conceived. I

saw a lesson given recently to a junior class in which the children were first invited to draw an object without hint or help of any kind. They then made a second drawing, following carefully, line by line, the guidance of the teacher. Great was the disgust of the latter when the second set of drawings was found to be manifestly inferior to the first, in spite of the valuable advice which had been given. To the onlooker the reason was obvious; the painful process had destroyed the vital interest in the subject, and the children were merely reproducing the meaningless lines of the teacher. The necessary teaching should be given before the attempt of the children, and they should be allowed to attack their work "red-hot."

This portion of the subject cannot be dismissed without insistence upon the importance of individual criticism and correction. With the present large classes there is a temptation to neglect this valuable exercise, and, as a consequence, faulty proportion is often the greatest defect in school drawing. With a class of fifty children, a skilled teacher, quick to detect mistakes, can do little more than a finger movement here, or a stroke of the pencil there; yet without many such corrective hints the lesson is of small value, even though a subsequent examination of the drawings takes place. In all corrections care should be taken to respect the natural pride of the children in any honest attempt made by them, and no unnecessary mutilation of their work should take place.

The Teaching of Perspective.

The need for some elementary notions of perspective will become apparent before the drawing of solid objects has proceeded very far, although a formal knowledge of the subject may never be required. Ruskin shows the impossibility of drawing the subtler forms of nature by the laws of perspective, which are too gross and few, and states that Turner, although professor of perspective to the Royal Academy, did not know what he professed, and never in his life drew a single building in true perspective.

He states, however, that it should be treated with "common civility," and this should probably be our attitude in the schools. No mention of it should occur in the early stages, and in the middle school it will probably find no place. The early lessons should not be given until the child begins to realise by experience the need for some knowledge of its rules.

The few necessary principles can be obtained from the personal observation of the children; but, although the idea of foreshortening can be given in the classroom, the teacher will discover that he must depend for ideas of vanishing and diminishing size upon out-of-doors experience: the railway and its telegraph-poles, the street and its lamp-posts. The children do not, however, grasp the fact that these principles apply also to the smaller objects which it is possible to present to them in the limited space of the classroom. Hence, if the reality of perspective, at close quarters, is to be brought home to them, some form of the glass or wire plane is advisable: the latter is preferable, as the smooth surface of the glass will not take ordinary chalk or crayon. Where the classes are large, each child should be supplied with a light frame across which wire gauze has been stretched. This can be fixed, uprightly, to the desk, in the same manner as the millboard for freearm work. On it they should be required to mark out the outline of a plane figure, such as the square, seen uprightly, and made to present three or four different appearances, either by revolving it or by allowing the children to move their position with regard to it. A series of similar sketches should be made by the teacher on the blackboard. Most of the necessary principles can be deduced from this set of examples, but other portions of the square should be similarly treated; and the oblong, triangle, and circle should follow before attempting solids with these faces.

The use of wire models will greatly aid the realisation of the perspective of solid form, as they help to overcome the difficulty of the hidden, or partly hidden, lines and faces.

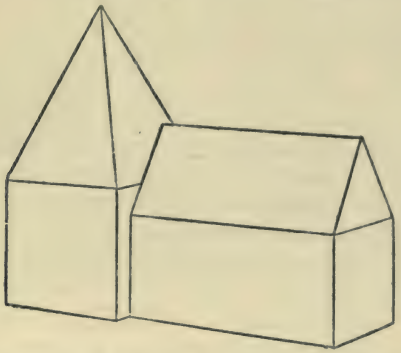
Good blackboard demonstration should be a feature of all early model lessons, but it will be well to reverse the board before the children commence drawing, and thus remove the temptation for them to reproduce one of the sketches of the teacher rather than the view before them. Common objects, presenting features of difficulty similar to those of the basic models, should immediately follow the use of the latter, and this practice may, with advantage, be introduced earlier, so that natural objects, flat in form, are drawn in perspective immediately after the plane surfaces dealt with in the previous paragraph. Thus a plate, or Japanese fan might follow the circle, and a jar or flower-pot the cylinder.

The Basic Models.

One hears a great deal at the present time about the wisdom of abolishing the use of the basic models in our schools. We are told that they are abortions, or, at the best, abstractions; that no such shapes exist in nature; that they have no interest for the children, and that their place should be taken entirely by common objects. While frankly admitting their abuse in the past, when model drawing frequently began and ended with these conventional objects, their abolition would be a mistake. They present to the child, in the simplest possible manner, certain fundamental difficulties, and the practical teacher, who has wrestled with the task of teaching the perspective representation of solid form, will appreciate the need for a presentation of such form, stripped of all unnecessary detail. The child who would flounder hopelessly if taken out to draw the village church, without preparation, would probably conceive its form truly, and attack its difficulties properly after drawing the group of four simple models shown on *p.* 235,—an example commended to those who advocate *only* the real object. Even on the score of interest the superiority of common objects cannot be conceded—to the children a jar is simply an every-day object, without interest, unless it contains jam; but the cylinder on the shelf in the art-room has had a fascination

for them since first they saw it, and wondered what could be its purpose. The very perfection of form which these models illustrate is in itself an attraction, and the artistic sense may surely be better stimulated by drawing a beautiful vase than by carefully delineating a tin can.

When a new idea in education is brought into the field, we are often too ready to abolish the existing methods as bad



instead of retaining whatever of good is in them. The models have still their use in the schools, but that use is a limited one. A course of simple object drawing in the lower school *must be a preliminary to their introduction*, for it is not until after a thorough examination of many forms that the power to abstract basic form and to deduce laws governing its appearance becomes possible. When this stage is reached, an intelligent use of the models is highly desirable.

The Teaching of Colour.

As a nation we incline to drabness, and usually ally it with respectability; we dress in black or the darker greys, and we reverence the dingy brick and stone monotony of our streets. Whether this is the result of Puritan traditions or depressing weather conditions is not for us to determine here, but we should be concerned when our boys and girls neglect, and even learn to

despise, the study of colour, and are indifferent, not only to an essential part of their æsthetic education, but to one which may enter so largely into their after life.* Possibly the school is to blame, and the cause may be found in the fact that the training of the elementary teacher has included no course of colour, and that even the art teacher, until a few years ago, could become certificated with no knowledge of this branch of his work.

The colour sense of the young child develops very early in life, and his hunger for colour contrasts strangely with his later ignorance and neglect of it. In the first years of life—as with savages—vivid stimulations alone prevail, and the child can only swallow large masses of bright primary colour; but gradually softer hues and more refined harmonies and contrasts are appreciated.

In the lower school the crude effects of chalk† and crayon may suffice to express the immature notions of colour which the child possesses, but when the need for training becomes apparent, some knowledge of the theory of the subject must be given. No other branch of art work lends itself so well in the early stages to scientific treatment; and nature herself gives the hint by providing the splendid phenomenon of the spectrum, a natural colour chart, which in the form of the rainbow is always one of the delights of childhood. The spectrum colours, red, orange, yellow, green, blue and violet, may be made the basis of the early lessons; red, yellow and blue being selected as the primary colours, and the intermediate secondaries being formed from them. The scales of each colour may then be obtained, and the effect of adding more or

* This may be better realised when one considers the extent to which colour enters into the work of the tailor, dressmaker, milliner, draper, upholsterer, furnisher, decorator, and a host of allied trades, and remembers the army of men and women included in this list.

† The chalk at present supplied to the schools was never intended to be used for colour illustration, but for blackboard emphasis. The crude effects referred to might therefore be considerably improved if school authorities would insist on manufacturers supplying them with suitable colours.

less of red or yellow to form orange, may be studied, and the compensating powers of each observed.

But how may colour be produced and analysed before the class when it is so difficult to mix and handle pigments in such a way as to make effective demonstration with them possible? The colour wheel, on which slitted discs of each of the colours can be arranged in any required proportions and rapidly spun round to give the resulting colours, appears to solve the difficulty. Thus, by varying the size of the blue and yellow discs, the various greens may be obtained; by adding certain sections of the white disc, the various tints of each appear; or by substituting black, the shades may be shown. In this way the exact quantities which make up each may be accurately measured. Exercises in matching on the wheel the colours of natural objects may be given; or colours of unseen combinations may be spun, and the scholars asked to analyse them, the answer being confirmed or otherwise by stopping the wheel.

The paint-box will now be to some extent revealed, although the exact value of the colours of the various pigments will not be realised without much experience. The children are, however, in a position to prove, or disprove, their previous experiments by mixing these colours, by making scales of various tones and of different degrees of intensity, and by whirling self-made discs and comparing the results.

The use of colour in manufactured articles may here receive some attention, and coloured strips of cloth or pieces of ribbon may be arranged in scales, and matched from the paint-box.

The effect of adding chinese white to give "body" to the colour may next be illustrated, and its use shown by exercises on tinted paper. At some later stage the grinding and mixing of colours might be performed, and reference made to the effect of using various media.

In the earliest washes attempted the mechanical difficulty

of controlling the colour will become apparent, and the children will appreciate the need for guidance after one or two failures. Some of the exercises recommended by Ruskin in his "Elements of Drawing" may here be taken with advantage; and a perusal of the whole book is prescribed to disciples of the "go as you please" school of drawing.

Having conquered the initial difficulty of manipulating a wash, exercises in treating a simple flower or leaf with a flat wash of one tone may commence, the children being allowed to mix and match the colour required.

Nature may then be approached more closely, and its subtler colouring attacked. The light green of the early leaf-shoots may be compared with that of the later growth; the tints of the lime, sycamore, and holly, may be contrasted; leaves of various kinds may then be arranged to form approximate scales of green. These may be matched from the paint-box, and notes made of the methods of obtaining the variations required. The yellows of the primrose, crocus, cowslip, dandelion, etc., may be similarly treated. Other illustrations will readily occur.

Examples requiring more than one colour may now be attempted for object drawing, and gradually the broad effects of light and shade may be added.

Throughout the latter part of this course the children should be encouraged to notice peculiar colour effects, such as the action of light in modifying tints; the result obtained by gazing at objects through a piece of coloured glass, and hence the value of a pervading tone; the varied appearance which the same object presents under different conditions,—for instance, the brown of smoke against a light sky and its blue appearance against a dark background. Such examples will compel further observation, and may lead them to appreciate not only the full beauty of a sunset, but even the rich effects of the light through the mist or fog of a London street.

The Teaching of Light and Shade.

Considering the important part played by light and shade in the visualisation of objects, its neglect in the schools in the past is somewhat remarkable. Teachers have too long been slaves to mere outline, but now that mass drawing has established itself in the lower school, its gradual extension through the middle school to studies in tone should be rendered easier; especially if the children have been allowed to express the local differences of tone which many objects possess. As soon as they are able to realise the broad effect of light and shade—which may be best appreciated with the eyes half closed—they should be encouraged to represent it; and objects, such as a ball, a stone, or a glazed jar, should be supplied, which can only be adequately rendered in black and white. The lighting of such objects must be carefully arranged, from one side only, but in most modern classrooms this should not prove difficult. It will probably be found that the sharper contrasts on a polished surface are appreciated before the softer gradations of a dull one; but simple casts, on which nothing interferes with the true play of light and shade, are of the utmost value.

Tinted paper may be introduced with advantage as providing a suitable background. It also simplifies the process in the earlier stages, as it is easier to work in both directions from the neutral tint towards the more easily perceived black and white, rather than from the white through the subtler neutrals to the black. A rough surface and soft point (chalk, crayon, charcoal or pencil) must be provided, and only direct methods of work should be allowed; all rubbing, stippling, and scratching being discouraged. As the power to appreciate light and shade develops, colour studies in tone may be attempted.

The division of the subject into water-tight compartments (freehand, model, light and shade, etc.) has been largely responsible for much misconception that prevails, but without

attempting a logical division of the subject it may now be advisable to deal with some of the branches of school drawing, using the terms commonly employed:—

Mass Drawing.

Mass Drawing does not include sketches made first in outline and afterwards smudged in with chalk, crayon or paint; but only real attempts to express *mass* by commencing in the centre and working to the boundary of the object presented. In the early stages of drawing it is of great service, as it concentrates the attention on the real form of objects, rather than on the shape of the boundary lines containing them. As a correction to faulty proportion, it should be used on occasions in the upper school, and the silhouetting, or shadow-portraiture, of objects with the brush will always be found of value.

Outline Drawing.

Outline Drawing is the simplest method of suggesting the shape of an object, but is one that involves the power of abstracting form, and is therefore not suitable to the early stages, especially if it involves a reduction in the apparent size of the object. Its abuse in the past has led to the manufacture of indiarubber for school purposes on a large scale. Children struggled vainly to express in pencil copies that, to them, were merely a tangle of lines enclosing spaces of which they had no conception. From this arose the extreme suggestion that the copy should be totally abandoned, and the equally extreme notion that objects, and objects only, must be attacked, with no guidance in the best method of expressing them.

"The Copy."

This contempt of the copy cannot be justified. Drawing is largely a matter of selection and expression, and to this end the copy is most useful. In literature we do not consider that it is useless to study the great masters in style. Artists may learn much from the lines of Dürer or the direct methods of Phil May. Similarly, children may learn much by the study and reproduction of objects depicted by draughtsmen skilled in the

art of seizing the essentials and expressing them at their full value; but in all exercises in drawing from the copy care must be taken that the children understand the full meaning of each line drawn.

Again, many objects which should be known to the child, and which afford splendid examples of great principles, are accessible only by means of a copy. A lighthouse, with its suggestion of fitness and stability, of proportion and symmetry, affords a good illustration of this point. Even the conventional classical copies may still find a place in schemes which attempt to convey some knowledge of ornament, and their use may be made of considerable historic value.

In spite of this defence of the copy, however, Object Drawing must be regarded as *the bed-rock of all schemes.*

Object Drawing.

In the early stages it should be taken chiefly to ensure careful observation, and to obtain fuller knowledge of the object, regardless of perspective,* and without attempting to abstract the basic form. In the later stages it should crystallise this knowledge, and render the child able to abstract and analyse the form, to deduce certain rules governing its appearance, and, finally, to depict it in any given position.

Objects of all kinds must be utilised, whether natural or manufactured, whether large or small; but the size will determine the arrangement of the class. Thus a penknife, key, insect, leaf, or flower may be used for individual work; a hat, fish, spray, or shell for small groups; a table, chair, fireplace or cupboard for the whole class; and a gateway, pigeon-house, garden-roller, shed, or tree for out-of-doors work. Not only will school furniture supply suitable objects, but the science room, the museum, the manual training room, the cookery and laundry centre, the school-keeper's storehouse, and the garden shed may each contribute their share. In addition,

* Objects flat in form, such as leaves, should be used in the early stages, and these may be placed so that frontal views are obtained, and the need for perspective thus eliminated.

the children should be encouraged to bring suitable playthings, articles of food and dress, and garden products. The teacher may supplement all these from "the botany box"—if in use—and from the shops of the fishmonger, fruiterer, etc.

The objects should be drawn from more than one position wherever possible: front views, end views, and side views should be obtained; views from above, views from below, and views from the level of the eye should be drawn; sometimes the objects should be upright, sometimes lying down, sometimes even tilted; at times they may be near, at other times further off; but incongruity of position must be avoided.

Variety in the materials and methods of expression should also be introduced. The objects may be drawn sometimes in mass, sometimes in outline, sometimes in light and shade, and sometimes with the introduction of local colour. This will add largely to the interest and value of the work.

In the later stages some attention may be paid to the drawing of objects in such a way as to describe them for commercial purposes. This descriptive drawing should include a rough sketch of the complete object, a plan or elevation showing the actual measurements to scale, and side drawings of a more complete nature, to illustrate important detail.

Memory Drawing.

It is only of late years that Memory Drawing has received due recognition in the schools, although the power of drawing from memory is of the utmost use in actual life—whether scientific, artistic, constructive, or commercial needs are considered. Its educational value is our chief concern, however, and this depends largely on the extent to which it assists the observing powers of the children. No other exercise in drawing compels them in the same degree to seize what is typical and essential in the object.

The lesson may be taken in many ways, but in the earliest stages only remembered sketches of objects previously drawn should be expected.

The commonest method employed is to present an object for a short time, and then withdraw it. This allows the children to correct personally the mistakes arising from faulty observation, as the model may be again placed before them after the exercise is completed.

Objects chosen from a list appointed for study may also be given, and, in this case, better results may be expected, as complete examination of the object should have been made.

Others may be given without previous notice or preparation, but care must be taken that these are well within the range of observation of the children. It will be found that many are surprisingly ignorant of the shape of many things with which they are in every day contact—a boot, for instance.

The children may occasionally be allowed to draw what they like, and, under these circumstances, the teacher will often gain a valuable insight as to what interests them most.

Imagination drawing, suggested by the reading or literature lesson, also finds a place in the syllabus of some schools. It must be remembered, however, that the "age of disillusionment," when the early spontaneous drawing of the child appears absurd to him, occurs in the life of the junior school.* After this intervenes a period when his powers of expression are not sufficiently developed to enable him reasonably to carry out his ideas; hence the method is of little value in the middle school.

Careful correction is of great importance, as the memory drawing lesson is a test, and has similar dangers to the dictation lesson. What the child does not know he will probably invent, and there will remain a tendency to remember the invention rather than the real thing. In those exercises where the object cannot be again put before the children, the worked papers should be immediately collected, and not again seen until the mistakes have been set right.

---

* *See* Diagram, *p.* 224.

As the object drawing lesson must include many nature studies, and the observation lesson many sketches, the closest possible co-ordination should exist. It will be apparent that each subject helps the other; but the drawing lesson should aim at developing the power to set down properly what is observed.

Nature Drawing.

To this end special attention should be paid to the best methods of suggesting the bending and twisting of the leaves, their junction with the stalk, the arrangement of the veins and their relative importance to the rest of the drawing, and the general plan of the serrations and the kind of line best calculated to indicate them.

The difference between diagrammatic and purely expressional drawing will become apparent through the nature study lesson, and the separate aims of each should be clearly shown.

Reference has already been made to the value of Freearm Drawing, especially in the lower school. It simply recognises that we should proceed from the greater to the less, and introduces no new principles. It is only necessary, therefore, to emphasise the importance of affording real opportunity for free movement. The present form of school desk is generally unsuitable, and, if the wall space round the room is used, difficulty is found in placing the object to be drawn, so that the child need not turn to see it. The provision of simple easels appears to be the best solution of the difficulty.

Free-Arm Drawing.

Design is always a favourite lesson with younger children, who base their work on naturalistic methods, but soon develop a sense of rhythmic arrangement, even without much aid from construction lines. The exercise is useful in stimulating the inventive powers, but generally design should not be carried very far in the schools, except in special cases. Where it does form an essential part of any course, applied design should be introduced as early as

Design.

possible, and the children should be made to feel the limitations of their materials and conditions.

Mechanical Drawing.

It is being gradually recognised that Mechanical Drawing should be taken chiefly in connection with practical mathematics, manual training, etc., and reference to it will be found in the chapters dealing with those subjects. We are here concerned mainly with free drawing, but it may be noted that scale drawing, from actual measurements made by the children, is a most valuable exercise; and that the drawing of geometrical objects, such as a clock-face or barometer, may be attempted occasionally.

Modelling.

The subject of modelling hardly falls within the province of this chapter, but its importance must be the excuse for a brief reference to it. The plastic art has existed from the earliest dawn of civilisation, and numerous biblical references might be quoted in proof of its antiquity. Recognising that clay would respond readily to the touch, and would retain the shape given to it, man projected his ideas into so obedient a material; afterwards baking it, or casting it into a more permanent form. Thus the early potter and the modern sculptor find a common basis for their art.

To the child—who ever delights in active expression—a plastic material has much attraction. He likes to fold paper into ships, to build castles of sand, and to chip or carve wood; but a piece of putty—surreptitiously annexed—has a charm possessed by none of these materials; it is a thing of life, and responds readily to his will.

No other form of expressional work appeals so immediately, and the educational value of modelling is recognised by all who believe in active training. In Drawing we learn the object as it *seems*, but modelling teaches us to realise what it *is*. By its means the material existence of things is comprehended: as the clay must be actually handled and

its mass truly gauged. Thus the third dimension becomes a reality, and, not only are the varying appearances which result from the change of position properly appreciated, but the incidence of the light and shade is also understood. Moreover, it helps to get rid of the conventional outline image, which Drawing tends to substitute for the real thing.

It will sometimes be found that children who are weak in Drawing find their true medium of expression in modelling; and for children of defective eyesight its advantages over the former are obvious.

The ideal plastic material has yet to be discovered. Clay —although still the best medium—has so many disadvantages that, unless a special room can be set apart for the work, one of the substitutes now obtainable, such as plasticine, is recommended. This is always ready for use, and each child may have a section, readily accessible, for illustrating the geography or nature study lesson.

The best tools are the fingers, and the wooden or wire tools which are provided should only be used as a last resource for work which cannot be reached by the fingers. Otherwise, there is a considerable loss of tactual sensation, on which the value of modelling so largely depends.

The objects chosen should be round in character, as the scraping and flattening required to obtain straight edges is of little value in proportion to the labour involved. The "relief"—or projection from the ground—should be fairly high, and the model should contain bold gradations of surface and variety of plane. It will be found that such objects are usually unsuitable for outline drawing, and that, apart from modelling, they can only be adequately rendered in light and shade. Nature offers an infinite variety of suitable examples, and certain casts afford most useful exercises. Memory modelling is also of value.

The forms should be obtained by building up from the slab of clay, which should be used as a background. They

should never be carved out with tools, or pinched into shape with the fingers, and simply stuck on; although there is no objection to shaping the form roughly before placing it into the position in which the fingers are afterwards to model it.

Some objects, such as the plum or banana, may be modelled "in the round," that is, open on all sides, and requiring no background. Under these circumstances, the clay should not be held in the hand, but supported by a peg fixed to the board.

In all cases the children must be allowed to move freely about the model, and to obtain every possible view of it, or they will fail to realise truly the relief, or third dimension, which is the essential of all good modelling.

Schemes of Work.

It is not proposed to set forth any detailed syllabus of work. Many schemes have been published, but from their very briefness they convey little or nothing to the teacher most in need of a prop. The scheme set out in Appendix V. of the *Suggestions to Teachers* may be recommended as a basis, but from what has been said in this chapter the thoughtful teacher should be able to evolve what, to him, will be a real living scheme, suitable to the needs and capabilities of his children, and to the necessary limitations of his own powers and conditions of work.

It is not expected, nor would it be desirable, that all the suggestions that have been set forth should be included in such a scheme. But, having due regard to the above-mentioned limitations, if a scheme is to ensure that interest which alone can make it successful, it should aim at obtaining the greatest possible number of expressions in the greatest possible variety of media.

(H. B. M.)

CHAPTER XII.

Manual Training.

What Manual Training is.

From time to time quite a number of names have been bestowed on this subject, most of which are still in current use. Manual culture (suggested by Dr. Woodward); Manual instruction, handicraft (the former was once and the latter is now the name used by the Board of Education); Sloyd, a Swedish name corresponding to our term "sleight of hand," or dexterity; educational handwork, a term many educationists prefer; "learning by doing," which is rather a motto than a name; hand and eye training;—these are the terms which have been most in vogue, but "manual training" is used more than any, and perhaps all of them.

"Manual training" literally means the training of the hand but necessarily much more is thereby implied than can be stated. The eye must inevitably perceive what the hand is doing; the body must conform itself to positions in which the hand may be used; and the brain must act upon the hand, eye, and body, and itself be acted upon by them.

A true conception of manual training may be justly conveyed to the mind by a slight alteration in Emerson's dictum, "Manual labour is the study of the external world." Let "training" take the place of "labour," and the phrase will not be too comprehensive to serve.

The spirit in which manual training is to be carried on, and the grand purpose which it is to serve, can be well expressed

in Montaigne's characteristic words, "I had rather forge than furnish my mind"; though in truth forging *does* furnish. And the manner in which we should regard that wonderful member, the Latin name for which (*manus*) is identified with this form of education so intimately, may be summed up in Aristotle's definition, "The hand is the **instrument** of **instruments**, and the mind is the form of forms."

In short, manual training is that mode of education which mentally and physically develops and instructs a child by employing his hands on the greatest possible number of suitable materials, in the greatest possible number of manipulations.

Not one of the child's school lessons brings him nearer to reality, and hence nearer to a true interest, than his manual training lesson; nor is there any better means of realising Herbart's great idea of an aesthetic revelation of the world: that idea which is the first presupposition of interest, and which supplies such a motive to the acquisition of knowledge that all thoroughly imbued with it become insatiate learners.

The Aims of Manual Training.

The aims of manual training cannot be other than synonymous with the aims of education in general, but a short statement of them may prevent misunderstanding. Hooker says, in *The Laws of Ecclesiastical Polity*, "Man doth seek a triple perfection: first a sensual, consisting in those things which very life itself requireth, either as necessary supplements or as beauties and ornaments thereof; then an intellectual, consisting in those things which none underneath man is either capable of or acquainted with; lastly, a spiritual and divine, consisting in those things whereunto we tend by supernatural means here, but cannot here attain unto them."

Let us take Hooker's definitions as a text, and consider briefly the aims of manual training under the heads: (1) Sensual, (2) Intellectual, (3) Spiritual.

I. SENSUAL.—Obviously this word is not used with the limited meaning it now possesses. By sensual things are meant the things the senses may perceive.

Sense-Training. The sensual appears to be the only stage of perfection which many advocates of manual training have endeavoured to reach. Under this head the aims are to cultivate the sense perceptions of the child.

(*a*) *Tasting* is not important enough to be considered in the present connection.

(*b*) *Smelling* may be exercised upon the aromas of various woods (for instance, a boy often finds it impossible to distinguish between mahogany and cedar except by smelling them), and upon the liquids used in finishing off wood and metal work (clear polish and turpentine look, but do not smell alike). Other instances occur, but Smelling is not an important sense in manual training.

(*c*) *Hearing* presents greater scope for culture. The boy may need to detect when an iron loosens in the plane, to appreciate the "whistle" of a sharp plane, to recognise the proper rhythm of a saw, the true thud of a well-aimed striking tool, the musical vibrations in working wood and metal, and so on.

(*d*) *Seeing* presents a vaster field, and the cultured vision is one of the greatest things manual training aims to produce.

(*e*) *Feeling*, the sense of touch, is the *chief* sense employed. It is in some respects the most *delicate* of all the senses, and is the most *active* sense of all. Sir Charles Bell, whose masterly monograph on the hand should be read by all teachers, says, "We find every organ of sense, with the exception of that of touch, more perfect in brutes than in man. . . . It has been said that accompanying the exercise of touch, there is a desire of obtaining knowledge; in other words, a determination of the will towards the organ of sense. Bichat says, "It is active, whilst the other senses are passive."

This training of the senses is to be carried on with reference to the production of efficient human machines; and, in the sensual regard, the utility of manual training is greatly to assist in laying foundations for all arts, trades and professions in which the eye may perceive and the hand achieve.

II. INTELLECTUAL.—The seat of the mind is the brain, and our greatest physiologists declare that motor activity builds up brain. Says Dr. Clifford Allbutt, "We have always been prone, and not in universities only or chiefly, to forget that the temple of education cannot be built without hands. These subtle ministers are directed by the mind, *but by the mind which they themselves have created*," The case of Laura Bridgman, whom Dickens describes in his "American Notes," and the more recent case of Helen Keller occur to our minds in this connection. Neither of these women was capable of exercising *any sense* but that of touch. Deaf, dumb, blind, without taste or smell, both developed considerable intellectual power by tactual experience only. Séguin, a Franco-American educationist, awoke various degrees of intelligence in idiot children, by simply putting them through systematic muscular exercise. The hand and speech centres of the brain are closely related to one another, and manual exercises have sometimes unlocked the mouth of the dumb. In fact the evolutionary theory of the senses is confirmed by embryology, and we have every reason to believe that *all* the senses are modified touch, and come from the skin layer.

Training of the Intellect.

Sir John A. Cockburn made this startling assertion at an educational conference, "They had to recognise that the nervous system—and even the wonderful brain of man—was a secondary manifestation (in the evolution of the human race); that activity was the law of life, and that the chief value of the nerve cells consisted in enabling the muscles the better to co-ordinate their movements. . . . The child was an epitome, a recapitulation of the process of evolution, and if they wanted

to educate the child in a natural manner, they must bear in mind which were the primary and which the secondary phenomena." No doubt the "secondary" phenomena (intellect and consciousness) are of the utmost significance, but they need a basis of motor and sensory experience. Further, manual operations continually demand mental concentration, and the brain acts and is acted upon thereby.

Manual training, then, sensually, assists in producing efficient human machines, and, intellectually, it helps to provide competent controllers of those machines.

III. SPIRITUAL.—We now come to the owners of these machines, and have to consider the moral value of manual training. Love for Truth, Perseverance, Obedience, Self-reliance, Joy in Labour—much could be written on these themes; but it were best to leave all this to the earnest student, who will not fail to succeed in this direction at least. But this may be safely said, that in degrees of importance manual training must always be considered—practical, utilitarian as it may appear—from the Spiritual first, the Intellectual second, and the Sensual third.

Training of the Soul.

The three materials most in use are, in the order of their importance, Wood, Metal, and Cardboard. This order is liable to transposition, however, under circumstances which require it.

The Materials of Manual Training.

1. *Wood* is clean and easy to work; cheap and convenient to buy; lends itself to infinite variations of form, and, to a lesser degree, of colour; brings us, perhaps, into closer touch with Nature than any other material; and can be made the basis for the greater part of geometrical science, and for a large part of art culture.

Wood comes into the manual training room in a less prepared state than metal or cardboard, and needs throughout a greater number of tools for its manipulation. It lends itself to all requirements of the constructive faculty. It is a material of

three dimensions, but is within rather more severe limits of manipulation than is metal, owing to its fibrous structure.

2. *Metal* has practically no manipulative limitations, owing to that cohesion of its particles which permits it to be bent equally in any direction. It lends itself to a great number of constructive forms, and in ornamental forging and repoussé work enters the realm of art.

It is a material of three dimensions, but in one form, that of wire, can be considered as of one dimension only, *i.e.*, length. Wire work is suitable for the early stages of manual training.

Wood and metal are able auxiliaries to each other in the more advanced stages of manual training. In fact, the boy who can effectively work on both metal and wood, and co-ordinate them on a given piece of work, may be regarded as the prime practical product of elementary training.

3. *Cardboard* is a useful material for beginners, and yet can be easily carried to considerable elaboration. It comes to the school a completely prepared material, which has, for handwork purposes but two dimensions. It lends itself readily to interesting treatment, constructive and artistic.

Several other materials such as clay, cane, bast and textiles are used in school handwork, but these come mainly within the scope of the Kindergarten. Clay modelling can, however, be carried on very profitably through the whole of school life, in association with wood and metal.

The Manual Training Room.

A specially fitted and equipped room is desirable for wood and metal work, but these and many other materials can be used in a class-room. As the woodwork room is, and is likely to be, a commoner requirement than a room for metal work I shall take it as the *typical* manual training room, and give a short description of it.

It should be fitted with desks for drawing and writing, and with *single* benches for woodwork. Attached to them will be

a sufficient tool container or rack. It is also desirable that lockers be placed somewhere in the room to contain work in progress and finished work.

Adjacent to this room should be a convenient place for the stacking of timber, the grinding and overhauling of tools, and the storage of supplies. The walls should be liberally adorned with maps, portraits of great craftsmen and inventors, photographs of famous mechanical inventions, views of noble buildings and structures, diagrams of trees, and pictorial representations of the work-a-day world. All these should be used in what may be called the broadening-out from the work in hand, and should be referred to constantly; for, as already urged, our purpose is to give the child an aesthetic revelation of the universe.

A small museum of models, specimens of woods, ores, and actual duplicates of tools in the various stages of manufacture would also be valuable.

The room should be fully equipped to carry out all simple operations in wood, with complete sets of the ordinary wood-working tools for each bench place; and, in addition, a lathe suitable for turning either in wood or metal. As a little metal work is almost a necessary concomitant of wood work, an engineer's vice and appliances for soldering and tin work are also desirable. A small stock of oils, colours, varnish and polish for finishing off the better specimens of work would be of distinct educational value, and act as a spur to urge the boys forward to an approximate perfection of finish.

The best Manual Training room would be divided by glazed partitions into, say, three compartments, possessing free communication with each other, the drawing being done in the mid compartment, and the wood work and metal work or other occupations on either side. This would be preferable to having three separate rooms, as the head teacher might then supervise everything from a slightly elevated platform in the middle.

This promising mode of education is at present confined within unnecessarily narrow limits, and I shall indicate briefly the much wider field in which it could be carried on. The training of the hand and eye, with all it implies, may fittingly commence in the infant school, and should go on *without a break* until the boy arrives at the end of that part of his education which he receives through the teacher. Many boys will find this termination in the primary school, but an increasing number will proceed to the University.

The Wider Field of Manual Training.

(*a*) *The Kindergarten.*—No department in the elementary school is under wiser guidance than the Infant department, and this is as it should be, for "Well begun is half done." The training of infants throughout the world has been largely influenced by Fröbel's idea of the Kindergarten, and by his practical scheme of gifts and occupations for the little ones.

It is when the infant is promoted to the girls' or boys' departments that it comes to that period in its education which has been called the unbridged gap.

(*b*) *The Unbridged Gap.*—The junior boys and girls, as a rule, get no systematic form of manual training, and it is not till the 5th Standard is reached that the former get some woodwork and the latter some practical instruction in domestic economy. We may say that the 2nd, 3rd, and 4th Standards are run too much on the same lines as for many years past. The absence of suitable handwork for these standards is a serious defect in the present school curriculum. It is very hard to get from any authority a satisfactory reason why the "gap" should be there. Manual training, indeed, should no longer be regarded as an "extra," but while it is thus regarded it would be better for grant to be paid upon the three years immediately after the Kindergarten period, than on the last three years of elementary school attendance. There are plenty of teachers enthusiastic enough and quite competent to bridge the gap;

plenty of materials are available, and yet little or nothing is done.

We make our children stumble down the cliffs, and struggle through the river, and clamber painfully up the other side of the gorge, instead of letting them walk straight along the broad-way of Learning which should bridge the gap.

(*c*) *The Upper Standards*.—It is in these that the ordinary forms of manual training are at present given, and I wish I could add that they are invariably well given. That manual training is not well carried on is sometimes, but by no means generally, the fault of the teachers. The whole conception of the work is very inadequate.

The usual place of manual training in the school time-table at present is an isolated one. Boys attend for one complete half-day, do some drawing, largely mechanical, and afterwards make at the bench the object they have drawn. Another week elapses, and then, very much out of practice, and to a large extent out of touch with their tools and materials, they again take their half-day at "Manual."

It can be easily seen that there is here much room for improvement. Co-ordination and correlation are the needful watchwords for manual training, as for many other subjects. The course of instruction adopted in the handwork room should ally itself intimately with all other branches of school work; and to this end a collaboration with the teachers of science, art, and ordinary subjects is quite imperative.

Correlation.

Many subjects which, at first sight, would appear to have little in common with manual training, are not so foreign to it as might be supposed. Arithmetic, geometry, mechanics, and art, in particular correlate naturally with manual instruction. For example, in arithmetic, the boy who has sawn out a number of cubes will feel keen interest in illustrating by their manipulation square and cubic measurements, an interest far more vital than if he is supplied with ready-made blocks. Much can be done also in

this connection by sawing slight strips to various lengths. In geometry, the boy who has made a cone, prism, pyramid, or tetrahedron is well equipped to deal with problems involving these solids. The development of many solids can be admirably carried out in cardboard or tin. In mechanics, the actions of the screw, wedge, lever and other powers receive constant exemplification in the hand-work room, and there is not the least doubt that the boy who constructs a piece of science apparatus gets a firmer grasp of his theory than by the very best ready-made thing that can be given to him. So also with the subject of art proper. Clay modelling, making the plaster cast and then carving in wood, or beating out in metal, form splendid correlated occupations; and the application of brush-work design, etc., to the blank spaces of models in cardboard and wood is a fascinating and profitable occupation for the scholar.

Geometry might be *wholly* taught in correlation with hand-work; mechanics and art very largely. Lessons on history may also deal with inventions and inventors.

Most children go from the 7th or ex-7th standards out into a rather badly organised world. It is for all educationists to see that they do so prepared to take a true interest in its busy life, and with a love and respect for manual labour; with sufficient knowledge and skill to enable them to continue their manual training as a congenial recreation at home, or in evening school, if not in their daily occupation; and with a pronounced faculty for "thinking in shape," as Thring of Uppingham so well called it.

The Sociological Aspect of Manual Training.

The place and influence of educational handwork in the ordinary walks of life demand some notice. Manual training regarded from a purely practical standpoint, will furnish the world not only with more capable producers of good work, but also with more capable appreciators of good work. No other mode of education possesses such a power of inplanting strong and increasing interest as manual

education. The spread of it will have, as one result, a great uplifting of art and craftsmanship generally, and an enlargement of those powers which are to present us with the working apparatus of social amelioration. The joiner who constructs a door, and the surgeon who operates on an eye, will each acknowledge the debt they owe to those whose wise provision gave them systematic instruction in manual work.

Not to be despised either is the development of manual training which with many persons will take the form of some practical hobby for their leisure moments. The man who acquires a love for wood-carving or repoussé work; who builds for himself a summer house or a boat; who makes for his own boys, or the boys of someone else, a squirrel cage or an aviary, will rarely be the man who lounges the evening through in a bar-room, or trifles his time away in listening to the inanities of a debased stage, or in devouring the gambling columns of the press. The boy who has been wisely trained through the medium of educational handwork, and who comprehends its significance will be the father of the man who will appreciate in a measure the noble architecture of St. Paul's and Westminster Abbey; the engineering of the Nile Dam and the Forth Bridge; the craftsmanship of Sheraton and Morris; the colours of Titian and Turner; and the sculptures of Phidias and Flaxman. The men of the future will be able better to appreciate or "apperceive" these glories of past times, and, if inspired to emulate them, better fitted to carry out their inspirations.

Even the sordid wage slavery, and the hideous factory of to-day, cannot altogether repress the natural joy of a man in the work of his hands; nay the veriest wage slave may draw a breath of life from some wholesome hobby; but better things are yet to be, when, as Thoreau says, to get a living will not be our trade but our sport.

Manual training is at once the oldest and newest mode of education. In past ages, before the first book was written, man was educated sufficiently for his needs by coming into contact with all the facts of the natural world which bore upon his existence. Informal but not ineffective manual culture has been going on simultaneously with the evolution of the human race.

Manual Training Considered Historically.

Since the time when man, but little more intelligent, and certainly more defenceless than an animal, first thought of hurling a stone in attack or defence, the improvement of weapons and tools has continued. Weapons were possibly invented first, and tools were an outgrowth from them. But the tool as an instrument of peace is steadily giving meaning of its own to the doctrine of the "survival of the fittest." The first tool may easily be imagined to have been a flint hammer, without a handle. After the handle had been attached, it occurred to some thoughtful savage to sharpen the ends of the hammer. Lo! an axe. Crude things these; but they were the forerunners of those latter-day marvels, the turbine engine and wireless telegraphy.

Little by little man has projected his mind into an infinite number of tools, instruments, and appliances. Coming into the world one of the most helpless of God's creatures he nevertheless, by reason of his master mind and servant hands, has subdued the universe to his needs—or whims. What antelope can run like an express train? What fish is much more at home in the water than a ship? What strength could cope with the force of dynamite? Nay, future generations will ask, what bird of the air sports more freely in that element than the aeroplane?

Think of the importance of the human hand, for it has achieved a thousand wonders such as these. Shall it be trained or not?

The answer cannot be in doubt, and the great question now is not "Shall we *have* Manual Training?" but, "What *kind* of Manual Training shall we have?" The success of the subject is assured, but final views have not yet been attained. Disastrous misconceptions of the place which handwork in schools is to fill are still widely entertained; and appalling mistakes in the methods of carrying on the work are far too common. This state of things is, of course, to a great extent, inevitable. Manual training in the making is only one phase. It will not be amiss here if I deal with what appear to be the three greatest needs to an understanding of our subject while in its present transitional stage.

The present state of Manual Training.

These are first, Simplicity; second, Experiment; third, *Sane* Accuracy.

1. Simplicity is a great desideratum in educational handwork just now, and particularly in the scheme of models by which instruction is to be conveyed. Many schemes there are in vogue, but not many of a really satisfactory nature. The Swedish Sloyd is still the best, though it is by no means faultless. Nearly every scheme now employed is too ambitious, and has not been devised with proper consideration of the child's capacities to observe and perform.

Simplicity.

The manual training room of to-day is by no means free from many of the faults which appear in the other rooms of the school. Valuable time is frittered away on a puerile system of marks and records; on the explanations of abstruse geometrical terms to children not long out of pinafores; on elaborate object lessons wherein the object is sometimes much to be desired; on the construction of intricate apparatus intended to demonstrate abstract propositions so thoroughly, that the child overlooks the knowledge to be instilled, in his vast admiration of the vehicle which conveys it. There is a great passion for tabulating, and codifying, and organising, and reducing to method, and playing about generally with the dry bones of

venerable educational corpses. The stress is on technique rather than on interest, and this subject is exemplifying afresh the fallacy of "formal training."

Simplicity is hard to reach, but we must unceasingly strive for it. The most valuable kind of teaching for children is *childish* teaching, a high and subtle kind of wisdom which will appear often to be mere foolishness to uninformed adults. One word of caution. In striving for simplicity we must beware of falling into puerility. We have all found out that boys and girls would any day rather be talked up to than down to, and that the average boy scorns nothing more than the well-meaning but inexpert adult's "baby-talk."

2. Our efforts in the direction of experiment should be unremitting, and, to a great extent, unpremeditated. It is not sufficient to say "Go to, now, let us experiment," but we must be in a position, to decide at any moment on the merits of an idea, and, if advisable, to put it instantly into practice. The advancement and proficiency of manual training does not depend on the rigid adoption of any one course of instruction, but upon the spontaneity, the virility, and the intelligence of those who are instructors of the subject.

Experiment.

The responsibility attaching to experiment in this or any educational matter, may be freely admitted to be a grave one; but, nevertheless, it is imperative that it be undertaken. We must not indulge in morbid fears of mistakes, although, as Goldsmith says, "Upon this subject of education the smallest errors are of the most dangerous consequence." The same writer, himself at one time a schoolmaster, also says, "But it should be observed that the more original any performance is the more it is liable to deviate; for cautious stupidity is always in the right."

The experimenter must have courage. He must be imbued with a self-reliance like that of Ruskin, who declared that nearly everything that he ever did of any use in this world had been done contrary to the advice of his friends.

I conceive that the best course of instruction should be based upon continual experiment in the following manner. Take even the very worst course that has ever been published, and make that a basis to work on. Let all teachers' experiments from time to time be collected by competent men, and at the end of a period of (say) five years let a new course, duly revised on the results of numerous successful experiments, supersede the original course. In the very worst course there would be some things worth retaining; in the very best course there would be some things requiring a merciful obliteration. Think, too, of the personal interest all would possess in teaching such a course, and the spur to continual effort accompanying such a rational undertaking.

Large and wealthy cities like London and Manchester might reap immense benefit, and ultimately effect economies by maintaining a limited number of manual training rooms, nay, even whole schools, as experimental centres.

3. There is an *insane* accuracy, and manual training is fearfully liable to the pursuit of it. A man of great experience once said to me, "What is the chief end and aim of manual training?" Before I could reply, he continued, "Accuracy!" I ventured to say, with diffidence, that, though accuracy was one of the aims, it was by no means the chief one. What is it we are to wish for in this direction? Is it for accurate drawings, accurate hand work, accurate conceptions, and accurate discipline? Yes, but what we really want are accurate boys. The accurate productions are but incidental. Accuracy must needs be relative, and not absolute, and in the pursuit of it the limitations of each individual must be duly regarded. Children to-day are being stunted and demoralised in the fanatical worship of accuracy. We offer up our tender little ones to the fetish, and he bestows upon them the St. Vitus's Dance and other morbid derangements. In all the vexed problems which demand our solu-

Sane Accuracy.

tion, let us consider the child first, the child second, and the child third. In our laudable desire for accuracy let us not forget the immature faculties, which so soon reach fatigue point; the little wandering minds, to which even the exertion of protracted attention soon becomes painful; the little, humble conceptions, which so soon become discouraged by our exaggerated standards of perfection. We run grave risk of becoming terrible pedants, even in the newer forms of education.

As opposed to a slavish form of accuracy, let me appeal for the cultivation of the habit of good guessing or judging; for appeals to the imagination: we cannot go through life with a two-foot rule, or a pair of scales, to measure or weigh everything. Something could be said in defence of the much despised old "rule of thumb," which, after all, is a happy facility of approximation; an intuition rather than a set calculation.

The Risks of Manual Training.

The use of tools by boys, especially at the commencement, must be always diligently supervised, and preceded by thorough demonstration. In woodwork, the saw and other rasping tools, and planes of various kinds, are perfectly safe for any boy to handle as soon as his strength is competent to their manipulations. Chisels and gouges are much more difficult to manage, and should not be used by any boy who has not had at least three, or, better still, six months' experience with other tools. In metalwork, wire, tin, and thin sheet metal can be operated upon by means of tools with perfect safety. Vice, lathe, and forge work contain greater elements of risk, particularly forge work.

Risk will be small in all handwork if the teacher has become perfectly familiar with the work he is teaching, and with the boys who are learning. He is himself always exposed to great risks from the actions of careless or thoughtless boys; and to preserve his own safety he must, to

use a common expression, be "all eyes." A still greater degree of risk begins when a teacher has too many boys to teach. Most experts in manual training contend that fifteen boys to one teacher is a quite reasonable maximum. Let it not be forgotten, too, that the handwork teacher, as a specialist, has a number of classes to handle, and must acquaint himself with the idiosyncrasies of from five to ten times the number of boys allotted to the ordinary class teacher.

The risk element is, after all, one of the best features in handwork, for it is good training indeed for after life to give a boy in school some acquaintance with dangerous surroundings. The little jags of the saw and slips of the chisel; the bruised thumbs and burnt fingers by the forge-fire and anvil, are so many vaccinations, as it were, which shall render boys greatly immune to worse haps later on in life.

Practical instruction in "first aid" comes only as an incident of manual training; but, nevertheless, is a truly valuable feature of this side of school work; and the thoughtful teacher, among his many parts, can play that of surgeon, much to his pupils' edification, while the teacher of hygiene will pick up useful hints for his own lesson from the events of the manual training room.

The fatigue point must be carefully watched for in the handwork class. A wisely arranged time-table will guard against excessive fatigue to some extent; but fatigue will often have to be avoided by a complete ignoring of the time-table, according to the task in hand. In the winter, when the boys come into a cold room, and any planing is to be done, it is well to do some of that first, and to draw after; while in summer, when much planing or sawing is required, it is advisable to break up the woodwork lesson by a little easy chat on some topic connected with the work.

Drawing.

Drawing should always accompany handwork, but must be carefully kept subsidiary to it. "The model's the thing." Drawing, to extend to a three-year course, might be allotted thus :—

1st Year. (Collective teaching.)—Blackboard. (Here the boy and teacher make the drawing together.)

2nd Year. (Group teaching.)—Diagrams. (Here the boy works from a prepared drawing, thus learning to read another's work.)

3rd Year. (Individual teaching,)—Actual Models. (Here the boy has the finished handwork before him, which he measures, and sketches from, and then prepares his drawings.)

N.B.—Diagrams should always be of a larger or smaller scale than the boys' copy. Slavish copying line by line is to be avoided.

Discipline.

Discipline in the manual training room varies from ordinary schoolroom discipline. It is necessary for boys to move about freely, perhaps to compare their work with a copy, or to obtain some special tool. Speaking generally, although the "drill-sergeant" style of discipline, even if desirable, is not attainable, a very natural, beneficial kind of order is to be had without undue trouble to the teacher.

Order.

Order is one of the chief lessons learnt in the manual training room. It is as necessary to be tidy and methodical here as on board ship. A place for every tool, the replacing of wood or metal in the racks, the leaving a well-swept bench at close of lesson, all conduce to good habits.

Demonstration.

Demonstration is imperative in the handwork room; the teacher must do, as well as tell. Drawing must be demonstrated, not only on the blackboard, but on paper such as the boys are using. With beginners, the teacher must construct bit by bit his model with the boys' models. With more advanced scholars he

must also demonstrate new operations as they occur. But he should be careful that he does not sap a boy's self-reliance.

The Unbridged Gap.

The making of simple toys and the apparatus for games constitute, perhaps, the best methods of "bridging the gap" of the lower standards. A toy may be a perfect example of science. The play-work of the Kindergarten may also be continued in the making of articles to illustrate tales, history, geography, etc. The "play" element could be gradually eliminated as the child developed the wish for serious effort, but the element of joy in labour would be retained undiminished.

The Scheme of Instruction.

The early stages of educational handwork should be confined to dealing with symbols of great simplicity, which may afterwards be continually repeated, yet in ever varying combinations. The models should deal first with right lines and angles, and plane surfaces; these should be followed by simple curves based on the circle, succeeded by elliptical and complex curves, and going on to a free treatment of curve and surface.

Problems in construction must advance slowly from the simple "housing" joint to the "secret dovetail."

Colour treatment, to which wood lends itself so admirably, should begin at an early stage.

Published schemes of work should be studied, but not slavishly followed, by the teacher, who must fit his own scheme to the needs of his pupils, which will be an ever varying one, according to locality and environment.

An Historical Sketch of Manual Training.

It is only in comparatively recent times that the systematic training of the hands has been thought necessary, and it is only within the memory of persons yet living that it has been widely included in the curricula of the schools.

An early reference occurs in Plutarch's *Life of Dion.* "Dionysius in his own nature was not the worst of princes;

but his father fearing that if his mind should be improved and enlarged, and he should converse with wise and learned men, he might plot against him, and dispossess him of his kingdom, kept him in close confinement, where, for want of company, and from ignorance of better things, he busied himself in making little chariots, candlesticks, joint-stools, tables, and the like wooden implements."

It is clearly impossible, on the strength of this statement, to hold up Plutarch as an early advocate of manual training, or Dionysius the tyrant as a shining testimony to the efficacy of "wooden implements" as an aid to the formation of character. Plato paid a special visit to him, but Dionysius seems to have profited as little by the philosopher as by his childish woodwork.

Quick, in his *Educational Reformers*, tells us that "as far back as Xenophon, we find a contest between the passive ideal and the active, between the excellence which depends on a knowledge of what others have thought and done, and the excellence which comes of thinking and doing."

Seneca, the tutor of Nero, once wrote: "The inventing of (useful) things is drudgery for the lowest slaves; philosophy lies deeper. It is not her office to teach men how to use their hands. The object of her lessons is to form the soul."

But Bacon has lived since Seneca, and imbued philosophy with the spirit of utility and progress. He actually died a martyr to his own teachings, by performing a dangerous experiment with his own hands.

"We shall next be told," exclaims Seneca, "that the first shoemaker was a philosopher." And in a sense he was, and, perhaps, a better than Seneca. Lord Macaulay writes: "From the cant of this philosophy, a philosophy meanly proud of its own unprofitableness, it is delightful to turn to the lessons of the great English teacher." The influence of Bacon's writings has penetrated into every department of the world's activities, and it is safe to assert

that the education of children by systematic manual occupations is one result of his ideas.

Even before Bacon, two great Frenchmen, Rabelais (1483-1553) and Montaigne (1533-1592), were strong advocates of "learning by doing."

Rabelais, in particular, describes his scholars as "recreating themselves in bottling hay, in cleaving and sawing wood, and in threshing sheaves of corn in the barn."

They also did something which many teachers of to-day would like their pupils to do; they visited workshops, where "they did learn and consider the industry and invention of the trader." There is indicated here, thus early, an inevitable development of the manual training idea. The Government of this country may yet consider education of sufficient importance to throw open freely, to groups of boys accompanied by their teachers, all their great establishments, such as Woolwich Arsenal, Chatham Dockyard, and the like, for educational purposes. Municipalities, too, will have to provide better facilities for using their parks, picture galleries and museums in the training of the young.

Mulcaster (1531-1611) believed in handwork forming part of school work: and in that century (the seventeenth), of which he saw the dawn, there begins to pass along the high road of practical education a host of men whose honoured names are inscribed high upon the roll of fame, for reasons often other than educational ones. By them the torch of progress has been handed on even to our day.

Comenius (1592-1671) deplored the "wretched divorce of words from things," and said that the knowledge of things and words should go together. He included in his scheme of studies a general knowledge of arts and handicrafts.

Sir Matthew Hale (1609-1676), a "myriad-minded" man, recommends as recreations, apart from severer scholastic pursuits, "reading of history, mathematics, experimental philosophy, nature of trees, plants and insects, mathematical

observations, measuring land; nay, the more cleanly exercise of smithery, watchmaking, carpentry, joinery work of all kinds." We might well inquire what Sir Matthew's notions of real hard work were, when his recreations took such forms.

Sir William Petty (1623-1687) makes an amusing reference to the delight which children take in "handling the tools of workmen, as soon as they turn their backs, and trying to work themselves." He also declared that, "all children, though of the highest rank, are to be taught some gentle manufacture in their minority."

John Locke (1632-1704), who humbly styles one of the best and most popular works on pedagogics, "*Some Thoughts Concerning Education*," and says, in his conclusion, that it is "far from being a complete treatise on this subject," has, nevertheless, included in his list of studies for a *gentleman* a very satisfactory course of manual training. Locke will speak for himself:—

"I would have him (his scholar) learn a trade, a manual trade; nay, two or three, but one more particularly . . . I should propose one, or rather both these—*viz.*, gardening or husbandry in general, and working in wood, as a carpenter, joiner, or turner . . . by the other (or latter, he will) contrive and make a great many things both of delight and use; though these I propose not as the chief ends of his labour, but as temptations to it: diversions from his other more serious thoughts and employments by useful and healthy manual exercise being what I chiefly aim at in it. Nor let it be thought that I mistake when I call these or the like exercises of manual arts, diversions or recreations; for recreation is not being idle (as every one may observe) but easing the wearied part by change of business: . . . (men who have) never learned any laudable manual art wherewith to divert themselves, (often) have recourse to those foolish or ill ways in use, to help off

their time, which a rational man, till corrupted by custom, could find very little pleasure in. It is want of application, and not of leisure, that men are not skilful in more arts than one; and an hour in a day, constantly employed in such a way of diversion, will carry a man in a short time a great deal farther than he can imagine."

Locke's suggestions of manual work as affording "many-sided interests" for all periods of life were not unknown to Herbart, and are worthy to be read along with the *Allgemeine Pädagogik*.

William Penn (1644-1712), the Quaker, has given us a compendium of wisdom in his little book, *Fruits of Solitude*, and in a very brief passage upon education, does not omit to indicate the need he saw for manual training. "We take pains to make our children scholars, but not men; to talk rather than to know; which is true canting. The first thing obvious to children is what is sensible (*i.e.*, that which reaches their senses, sight, touch, etc.), and that we make no part of their rudiments. We press their memory too soon, and puzzle, strain, and load them with words and rules to know grammar and rhetoric, and a strange tongue or two, that it is ten to one may never be useful to them; leaving their natural genius to mechanical and physical, or natural, knowledge, uncultivated and neglected; which would be of exceeding use and pleasure to them through the whole course of their life. To be sure, languages are not to be despised or neglected; but things are still to be preferred. . . . Children had rather be making of tools and instruments of play; shaping, drawing, framing and building, etc., than getting some rules of propriety of speech by heart; and those also would follow with more judgment, and less trouble and time."

John Bellers, another Quaker, contemporary with Penn, has given us one of the wisest and most compact statements of the philosophy of manual training: "The hand employed

brings profit, the reason used in it makes wise, and the will subdued makes them good."

The thoughtful student who values and converts to his own use these golden words will gain more profit thereby than in reading many pages written by better known men.

It is well to reflect here how the notion of employing the hand as much as possible in education has grown increasingly important with the lapse of ages.

The beginning of this sketch showed us Plutarch somewhat deploring the manual work of Dionysius, and at the stage where we are now arrived Bellers gives us the noblest possible idea of the manual element in education. He puts into a nut-shell the whole of the above section upon "The Aims of Manual Training."

We could almost desire a dictatorship of John Bellers, or some other plain man in the government of educational affairs in this country at the present time. "The chaos of the hour" might then quickly pass away and give place to "Cosmos."

Enter now an epoch-maker. For good or ill, or rather, for good *and* ill, Rousseau lived his life, and did his work. With his appearance upon the scene, the modern attitude to manual training is assumed.

Rousseau (1712-1778) was influenced to some extent by his predecessors, especially by Locke, but he himself exerted far greater influence in his turn upon his successors. It were well if every teacher living to-day would get within the sphere of that influence, by reading *Rousseau* instead of about Rousseau. The most vital statement made by him on the office of manual work in education is almost a hackneyed one, but limitations of space will permit no other:—

"If, instead of making a child stick to his books, I employ him in a workshop, his hands work to the advantage of his intellect: he becomes a philosopher, while he thinks he is becoming simply an artisan." I do not suppose most children

would think of becoming even artisans; for their delight in what their hands are doing is generally for them sufficient for the day, and the thoughts of normal children extend but little into future possibilities. Yet, while they are accomplishing, they are also preparing.

Basedow (1723-1790), under the influence of Rousseau, founded at Dessau a school called the Philanthropinum, in which every boy was taught a handicraft.

Thomas Paine (1737-1809) in his time played many parts, and has been one of the most hated men of recent times, principally for his attacks on established religions. As manual training is less affected by the religious question than many other phases of school life, it is not necessary to let our opinions be biased as to the value of the following words on education:—

"The human mind has a natural disposition to scientific knowledge, and to the things connected with it. The first and favourite amusement of a child, even before it begins to play, is that of imitating the works of man. It builds houses with cards or sticks; it navigates the little ocean of a bowl of water with a paper boat; or dams the stream of a gutter, and contrives something which it calls a mill; and it interests itself in the fate of its works with a care that resembles affection. It afterwards goes to school, where its genius is killed by the barren study of a dead language, and the philosopher is lost in the linguist."

In connection with this statement let it be remembered that Paine was no mean scientist and scholar.

Pestalozzi (1746-1827), in his novel with a purpose, *Leonard and Gertrude*, says, "Indeed it had been Gluelphi's plan, from the first moment when he resolved to undertake the office of schoolmaster at Bonnal, to connect at the very onset *all* his instruction with different sorts of manual employment." In an account of his experiences written for his friend Gessner he also says: "I tried to connect study

with manual labour, the school with the workshop, *and make one thing of them.*"

Our Board of Education still regards manual training as a "special" subject, but Pestalozzi did not. He was the first practical teacher to perceive the essential unity of head and hand work, and to carry out to a fuller extent than ever before the principles based upon this unity into practice.

Herbart (1776-1841) and Fröbel (1783-1852) both came into personal contact with Pestalozzi, and agreed with him in recognising the important place which manual work should fill in the schools. "Every older boy and youth," said Herbart, "should be able to handle the familiar tools of the joiner, just as much as rule and compass. . . . Every human being, in fact, should learn to use his hands, for the hand has its own place of honour beside the tongue in raising man above the brutes."

I now pass on to the last man with whom I shall deal; one who saw the dawn of the present century, and during the second half of last century ranked among England's noblest sons.

John Ruskin (1819-1900) tells us in more than one place of the power which he derived from manual work.

> "To succeed to my own satisfaction in a manual piece of work, is life,—to me, as to all men."*
>
> "Half my power of ascertaining facts of any kind connected with the arts, is in my stern habit of doing the thing with my own hands till I know its difficulty."†

He goes so far as to say that:—

> "No one can teach you anything worth learning but through manual labour."‡

He gives a notable, even startling plan for his model school:—

> "Every parish school to have garden, playground, and cultivable land round it, or belonging to it, spacious enough

* *Fors Clavigera.* † *Præterita.* ‡ *Fors Clavigera.*

to employ the scholars in fine weather mostly out of doors. Attached to the building, a children's library, in which the scholars who *care* to read may learn that art as deftly as they like, by themselves, helping each other without troubling the master;—a sufficient laboratory always, in which shall be specimens of all common elements of natural substances, and where simple chemical, optical, and pneumatic experiments may be shown; and, according to the size and importance of the school, attached workshops, many or few,—but always a carpenter's, and, first of those added in the better schools, a potter's."*

This is the ideal of one of the greatest art critics, one of the greatest moralists, and one of the greatest of literary stylists of our age. Such a man is not likely to have been biased by any of the narrow or fanatical notions sometimes associated with the work of the craftsman.

A Generation of Manual Training.

It will be matter for surprise to many persons to know that at Moscow, in 1868, systematic manual training was commenced in the Imperial Technical School by M. Victor Della-Vos, the director of that institution. It was an exhibit by this school at the Philadelphia Centennial Exposition of 1876 which caused the Americans to adopt manual training also, and soon afterwards Dr. John D. Runkle, who may be termed the founder of manual training in the States, started the work in connection with the Boston Institute of Technology.

The second manual training school in the States was founded as a department of Washington University, St. Louis, by Dr. Calvin M. Woodward, and opened for instruction in 1880. The U.S.A. is now perhaps the foremost country in the world in its whole-hearted adoption of the principles and practice of educational handwork.

The famous Näas Seminarium in Sweden was founded in 1872, and was directed from the start by Herr Otto Salomon until his death, in 1907. The hardly less famous

* *Fors Clavigera.*

school at Leipsic, in Germany, now conducted by Dr. Pabst, was established in 1887.

English manual training was largely indebted for its commencement to the example and influence of America, Germany, and Sweden, and the name of Sir Philip Magnus is, perhaps, specially to be remembered as a pioneer of manual training in this country.

On the recommendation of the School Board for London, an experimental class in manual training was begun, in 1885, at the Beethoven Street School, W.; but this class, owing to the action of a Government auditor, came to an early close.

In 1887, a joint committee of the School Board, the City and Guilds' Institute, and the Drapers' Company established three centres north, and three centres south of the Thames, and these were opened in January, 1888.

The recognition of manual training as a special subject by the Board of Education, in the Code of 1898, gave the School Board powers to act alone. The Joint Committee still continued to act with the Board, and started housewifery classes for girls, and metal works for boys, at Mary-le-bone Central Higher Grade School, in 1892. It is only quite recently that the Joint Committee, after a useful career, has been disbanded.

Evening classes in woodwork were first opened in London during the session 1892-93. Manual training now looms large on the educational horizon of the Greatest City, and the supplanting of the S.B.L. by the L.C.C. does not appear to have helped or hindered the gradual extension which has been going on since 1890.

There are at present (1907) 207 centres open in London, and it appears probable that, in process of time, the "Centre" will be eliminated, and each school will have its manual training room. "'Tis a consummation devoutly to be wished."

The great desiderata at present, in addition to improved

salaries and a better status, are a college of manual training, in affiliation with some university; a teaching certificate which shall be universally recognised; and the conferring of suitable degrees upon proper recipients.

Training of Teachers.

When these have become accomplished facts, manual training and its exponents will rank higher in the educational world than is now the case. The teachers will not be regarded as a kind of superior carpenter or blacksmith, but as the ministers of a very vital pedagogy. The manual training room will not be a sort of annex to the main building, but one of the central rooms.

Future Developments.

A "philosophy of manual training" is even now in active formulation, which shall some day place this subject, or method, or means (what you will) honourably among all the other great arts and sciences, not as a solitary "special subject," but as an active co-operator with all those noble things by which—

> "The thoughts of man are widened, with the process of the suns."

(H. W. S.)

CHAPTER XIII.

Needlework.

When the greatest dramatist of the nineteenth century wished to select a theme that would arouse with sufficient plausibility the contempt of his heroine—an emancipated woman without the emancipated woman's virtues—he chose "the domestic industries of Brabant in the Middle Ages." And Hedda Gabler's contempt was accordingly aroused.

Yet the time may come when such a theme may no longer inevitably strike the reader of Ibsen as ludicrously appropriate. There seems no *a priori* reason why the "monastic architecture of Normandy in the Middle Ages" should be a legitimate subject for antiquarian enthusiasm, while "the domestic industries of Brabant" should be appropriate only for the researches of a George Tesman.

Upon the "domestic industries" of various countries depended the welfare of large sections of mankind; ingenuity, and, perhaps, genius, were lavished quietly upon the perfecting of these homely arts; failure and success, disappointment and perseverance marked as much their history as the history of any art. It is hard to see why a glamour should be thrown around every other art—even that of destruction—and none around these. Is the home so unimportant an institution? Are weaving, and laundry work, and cooking, such insignificant factors in the history of civilisation that education has no concern with them, except when,

in compromise with the utilitarian spirit, it concedes an hour or two a week to their practice, convinced all the time that they are not genuinely "educative"?

Now, if education has any certain task whatever, it is to make such arts—"humble arts," I was about to say, in my folly—visibly confessed as stupendously important and limitlessly significant. That the doctrine of interest has scarcely yet been applied to the teaching of needlework, laundry work, and cooking, is of a piece with our whole educational procedure. Technique has been exalted to the chief place, with the result that technique itself has suffered; and the child who, in the seventies and eighties, was taught to knit socks and fix patches, now walks our streets, a grown-up woman, *minus* both. That any imaginable pleasure can be linked with the performance of domestic arts, that they possess a glamour, or meaning, or interest superior to that of beer or gossip, is not always realised as it should be by the women of our country.

Some day, I suppose, the plain facts about the human race will be taught in our schools, and the ages of man's later evolution, when the arts of pottery, and weaving, and the rest, were being invented and slowly perfected—partly, and perhaps chiefly (it now appears), by women—will not be ignored in the way that is so amazing to any mind of average enlightenment. And then, perhaps, the "glamour," and the "meaning," and the "interest," will come. The girl, like the boy, has the constructive impulse, and the task of education is to employ and exalt it.

It is in this spirit, and with this hope, that the following section has been designed. Though the chief theme of the chapter is needlework (closely related, of course, to weaving in all its forms) some of the other achievements of women's hands are here deliberately set forth, for the amusement of educational groundlings and the edification and stimulation of the judicious. Though to make a scheme of training in the

domestic arts, correlated with history, geography, hygiene, perhaps even poetry, is beyond the scope of the book, and would, indeed, demand the energies, not of one writer only, or of two writers, but of a host of writers—chiefly women, with minds open to the realities of the past and the possibilities of the future—nevertheless, the paragraphs that follow may serve to show that here, too, lies a land awaiting exploration.

(F. H. H.)

Work Done by Women.

To women's ingenuity and ready adaptability may be attributed the first stages of many of the great inventions of the present day. If the suction pump, for example, was not actually invented by women, the idea of it may have been hers. The women of Bakalahari obtain their water in the following manner. They procure a number of ostrich eggshells, which they place in a net; they next get a short reed, at the end of which a bunch of grass is tied, to act as a kind of filter. This simple contrivance is put in a hole, as far down as the arm can reach, then the wet sand is well pressed round it. The mouth is applied to the upper end of the reed, the water is drawn through the latter into the mouth, and then it is discharged into the shells, which are placed in wet sand at the home for future use. In this way the human mouth acts as a pump.

The idea of building granaries for the storing of food may be due to woman. In Africa and South California dome-shaped contrivances of wicker-work were raised on piles, to be out of the reach of rats and as a protection against the moisture arising from the earth. As a greater protection against the former evil, the wild cat was tamed, though when this work was first begun is unknown, as in the earliest written history of Egypt mention is made of the cat as being sacred to Sekhet. The cats were trained to domesticity by being secured when young, and used as playthings by the children;

they were allowed to follow their natural instinct of prowling at night. The taming of other domestic animals (partly by woman) certainly preceded the dawn of history.

The pestle and mortar now used most frequently by the apothecary were possibly invented by woman for the purpose of grinding grain, and in the case of some of the cold grainless regions they were used for pounding dried fish. Sometimes they were of stone, fashioned out of rough pieces of rock by the woman herself; frequently they were of wood, being more readily made of that material.

Leaving the subject of food, our attention is next directed to a very broad survey of the manufactures of primitive woman. Here, again, we find that her work was of more vital importance than that of man. Though different races naturally had different implements, there was one which was always to be found in the possession of every woman of the long past ages, *viz.*, the bone awl or stiletto. This little implement is largely used in basket weaving, and that done by the aboriginal woman is certainly worthy of much praise. Artistic form and colouring, together with delicate manipulation, give a most delightful effect. Closely allied to basket weaving is the art of weaving fabrics by hand, without any frame whatever. In Panama, very fine specimens of this kind of work are found. Forty pounds is not a high price for a Panama hat, considering the time and trouble it costs to make. For the best quality hat, the woman has to work at night, keeping her hands and the work under water the whole time that she is weaving, as the air and sunlight cause the straws which she uses to break as soon as they become dry. Consequently, the time taken is much greater than when the work can be done in daylight and above water. When the hat is finished, it is treated with a solution, which renders the straws very pliable.

Weaving.

Garments of bark cloth were worn by the natives of Hawaii, the fabric being made exclusively by the women.

The bark was stripped from certain trees, placed upon a piece of hard, smooth wood, and beaten with a kind of club until it was like a sheet of paper, water being poured over it, to make it more pliable during the beating process.

For the nearest approach to the invention of spinning, we must go to the Samoan women, who were adepts at twisting bark into cord, without the aid of a spindle, which was in common use among other races.

Passing from the weaving of fabrics, we now turn our attention to the material which is actually made, though it needs certain treatment before being of actual use to mankind, *viz.*, the skins of animals, reptiles, birds, etc. At the present time there are few women indeed who earn their living by the various leather industries, yet in the early ages the dead animals were brought to the women by the men, and they had to make the best they could out of every part of them. The skin was cut off, dressed, and made into clothing.

The Eskimo women made a kind of inner bodice of the skins of birds. These skins were simply dressed by being chewed on the wrong side by the women and girls; they were then sewn together on the same side with sinew threads. When the garment was finished, it was impossible to see where the different skins were joined, so neatly was it done. These same women used a scraper of walrus ivory or antler for removing all fat from the hides. This scraper was made to fit over the hand, in order that more force could be given to the scraping.

Needlework.

The foregoing paragraphs show briefly that woman was the originator of some of the most important modern industries. Needlework, however, is the more particular subject of the present chapter, and to that we must now turn. It is essentially the art for women, needing an abundance of patience and industry, both of which virtues are perhaps possessed in a greater degree by women than by men.

It is an ancient art. It was in existence before the last glacial period in Britain, as shown by the finding of a bone needle in the *débris* of one of the ancient caves. Sinews were then probably used as thread, and undressed skins as cloth, the arts of thread making and cloth weaving not being then known.

Its Early History.

There are records of Chinese needlework dating 5,000 years back, Indian and Egyptian 4,000 years, the last showing few changes in style. The Phœnicians, who were the carriers of high art from one place to another, traded with the Britons along the south coast, exchanging fabrics and embroideries for tin. By this means the dress of the almost savage islanders developed from skins to fabric garments. These were not of the meanest kind, many of the chieftains' wives discarding their skin clothing for that richly wrought in gold and silver.

Indeed, the art of dress, and that of needlework, are very closely connected one with the other, and, though needlework is not commonly considered one of the higher arts, its refining influence on mankind is just as great as that of the sister arts, painting and sculpture. The condition and character of the people of any country are largely shown by the dress that prevails.

Many men in the East had their homes, no matter how simple or how magnificent, decorated by means of the art of embroidery. Morality, religion, and the fame of great deeds were taught by this labour of women, when other teaching would have been laughed to scorn.

Embroidery.

Unfortunately, there are very few pieces of embroidery of which the date is known earlier than the tenth century, yet from the remotest ages to the present time woman has never wearied of adorning her home and those around her with stitchery of some kind. Thus, with the aid of so small and unassuming a weapon

as the needle she is able to beautify her surroundings, and to help to elevate the minds of those with whom she comes in close contact.

"She
Would ever with Marina be:—
Be't when she weaves the sleided silk
With fingers long, small, white as milk;
Or when she would with sharp needle wound
The cambric, which she makes more sound
By hurting it."—Pericles, *Prince of Tyre*, IV.

"Deep clerks she dumbs; and with her needle composes
Nature's own shape of bud, bird, branch or berry,
That even her art sisters the natural roses."—V.

There are not many people of the present century who realise the time, labour, and money spent on the old embroideries, designed and worked by both men and women. The invention of machinery has, unfortunately, largely done away with hand work, and, though production is cheaper, the result is, of course, very inferior to hand work. There is too much bustle and hurry at the present time to permit of sufficient leisure for the execution of fine needlework, besides which, there is no longer the need of it as a "civiliser" and "refiner," as in the days gone by, when man was not very much above the brute.

The condition of a country was often noticed in the dress of the people; if prosperous, the dress was very elaborately embroidered, even that of the men. The state of the mind was also exhibited in the same way; the sober dress of the Puritans contrasted strongly with the lavish display of the Royalists during the Stuart period. When the tastes of the people declined, the decorations became correspondingly rude, and this change was very noticeable in the embroideries. After a period, further changes took place, and once more an improvement in the crafts became evident, and the art of needlework in England, Germany, France, Italy and Spain grew and flourished.

Unfortunately, the particular style of needlework brought about by the Renaissance was most unsuitable for ecclesiastical work; it showed the taste of a frivolous and pleasure-seeking people, as contrasted with the former and more earnest period; too much repetition of design was exhibited, indicating the lack of freedom of ideas. From this degenerate period, English needlework, unfortunately, lost the prestige of former times.*

After the French Revolution, which was itself in a measure inspired by what were supposed to be classical ideas, the women tried to dress like the Greeks, though, naturally, the effect was much marred by the lack of grace in movement and posture. Napoleon wore a dress, supposed to be of Roman pattern, at his coronation. The two designs which seemed to predominate during the period were those of the "egg" and "key," and even in this twentieth century they may frequently be met with, forming the borders of dresses.

Present Position of Needlework.

It is quite deplorable to think how comparatively few women and girls of the present day can do really good needlework. The art of dress has certainly advanced, but handwork is, unfortunately, very much on the decrease, therefore it is the duty of all teachers to encourage their pupils to use the insignificant needle in preference to the machine, though, of course, for heavy work, such as dress and coat-making, the machine is preferable.

In Italian prisons, Sisters of Mercy are allowed to teach the female criminals the art of lace making and other fine sewing; the articles made are sold, and the proceeds help to pay the prison expenses. A very small amount is allowed the prisoners, and this they may send to their friends, who

* Mary de Medici brought back Frederigo Vinciolo with her from Italy as her designer for embroideries, and much of the English work was merely a copy from the French.

are at liberty to buy little luxuries for them. Such work as they are taught must have an elevating effect upon the women. Self-respect is often restored to the fallen and the incompetent when they discover that they can create something, whether that something be useful or artistic.

There are, perhaps, few other subjects which better show in their gradual development whether the child has had a careful and thorough training from the time when she could first hold the simplest implement. The teacher must always remember that needlework readily lends itself to moral training. The young and inexperienced teacher will often let her sole aim be to make her pupils form the correct shape of the stitch, no matter how this is attained. This is a very grave mistake; the teacher should first see that her pupils' hands are perfectly clean, and especially the nails, otherwise the work will become very much soiled, and no amount of good stitchery will make up for loss of cleanliness. If this fact is impressed upon the children's minds for a few times, the habit of looking at their hands and keeping them in good condition will so grow upon them that their attention will afterwards be turned to cleanliness in other directions, and thus a great and important step will have been taken.

Importance of Early Training.

When this point of cleanliness has been dealt with, the children may then be allowed to handle their work. They must first be taught how to thread their own needle; secondly, how to hold it ready for working; and, thirdly, how to hold the work for the particular stitch to be learned.

If these details are strictly attended to, the result obtained will prove their value. Whatever process is being worked, the material should be held as lightly as possible and the fingers should be kept apart, especially those of the left hand, as the air will then have a free passage between them and will thus keep them cool. In this way we lessen the

Handling of Work, Posture, etc.

possibility of the work becoming soiled by hot, moist hands, besides avoiding creasing the work more than is necessary. Another important point is the handling of the needle and cotton. When drawing the cotton through the material the child should carry the right hand towards the right shoulder, except in one or two processes, *e.g.*, buttonholing, and should always let the cotton pass between the second and third fingers. A child should never encircle the cotton with all her fingers, because by so doing a clean piece of cotton will become very much soiled after two or three stitches have been worked; too many joins make the work insecure, and sometimes give an unsightly appearance when not properly worked, as is often the case with young children. A fresh length of cotton should never exceed 18″, and for very young children it should not be more than 12″ in length.

The body must always be held erect, with the head *slightly* inclined, and the work must be raised sufficiently for the child to see clearly. If not corrected, children will sit in a huddled position over their work, whether it is resting on the lap or on the desk; such a position is most injurious, both to the spine and to the eyes, and rigid attention must be given to erring pupils. The feet must be kept flat on the floor; no crossing should be permitted.

Classification of Work.

Needlework is very readily divided into four distinct sections. They are:—1. Cutting-out; 2. Plain needlework; 3. Patching and darning; 4. Knitting. The first three are closely associated one with the other, as a garment has to be "cut out," then the "plain needlework" is used for making the garment, and when the garment is wearing out it needs to be "patched or darned."

I. **Cutting-out.** — Following this sequence, cutting-out should be the first process taught, but this is, of course, impossible with very young children, on account of the many difficulties it presents, one of these being the handling of the scissors, which are not easily manipulated by little

fingers; and though small sizes are used for kindergarten occupations, these are too small for ordinary garment cutting. This branch of needlework, therefore, must be confined to the elder girls, who should cut out the garments for the children in the lower classes, as well as those made by themselves. Not only should the girls cut out the garment in the material from a paper pattern given to them by the teacher, but they should first be taught how to cut the pattern by the folding method, and from a small diagram drawn to scale, showing all the necessary measurements.

First class girls might, with advantage, be trained to cut their own patterns without the aid of any diagrams whatever. Such work would necessitate a great deal of supervision and correction on the part of the teacher, but it would prove invaluable to the girls when they left school, as it would make them more self-reliant, and train their powers of reasoning and observation, in working out the correct proportions, and obtaining accurate curves and lines.

There are three rules in cutting-out which should be strictly adhered to; they are:—

(1) The selvedge way of the material must run from the top to the bottom of the garment; across yokes from left to right; for the length of neck and wrist bands.

(2) The right side of the material (in calico, nainsook, cambric, linen and zephyrs, the smoother side, and in flannel the more fluffy side) should always be outside.

(3) The nap (little hairs on the surface) of flannel should lie perfectly flat and smooth when the garment is stroked with the hand from top to bottom.

II. **Plain Needlework.**—The essentials of good needlework are:—

(1) Stitches must be of such a size as to be easily seen.

(2) The size and shape must be uniform.

(3) The wrong side of the stitch should be as accurate as the right side.

Fine stitchery should not be allowed, as it is most injurious to the eyesight, and although there are rules for working to thread, as *e.g.*, in herringboning and buttonholing, such work should only be done on very coarse material, where the threads can be easily seen, and it should be discontinued when the correct shape of the stitch is known.

Coloured cotton should always be used for specimen work, as defects can then be more easily detected. The cotton should be as near the thickness of the threads of the material as possible, except for gathering, when a stronger cotton is required, and for ornamental stitches, such as featherstitching. In the former case, No. 40 cotton is a suitable size, and for the latter crochet cotton should be used on cotton fabrics, and "flax," or "flourishing" thread, on woollen fabrics.

The selection of suitable needles also requires care; if too thick, they are apt to split the threads of fine material. No. 8 or 9 "betweens" is a good size, though, for very fine fabrics, such as nainsook and cambric, No. 10 needles maybe used.

III. **Patching and Darning.**—This branch of needlework ranks in importance with the plain needlework, though so frequently neglected. The teacher should always try to impress the old adage, "A stitch in time saves nine," upon the minds of her pupils, especially in the upper classes, as girls of the age of twelve to fourteen years are only too apt to consider a mended garment a disgrace, instead of remembering that the patch or darn, worked by themselves, is something of which they might well be proud. A girl who will mend her clothes neatly will, in time, become a careful and thrifty woman, whereas a girl who despises a renovated garment will possibly degenerate into a slovenly and extravagant one. Hence the necessity for early training in the art of mending.

After the methods of patching and darning have been learned on specimens, the children should put their knowledge to good practical use, by being allowed to take worn garments to school to mend under the teacher's supervision. In fact,

the working of specimens should always precede that of the actual garments, but the new stitches should be taught with the practical end of garment-making being kept clearly in view.

1. PATCHING.—This is the means of renovating certain garments by replacing the worn parts—in which there is usually a hole—with a piece of new, or partially new, material of the same kind as the garment. The patch must always be cut sufficiently large to cover the hole and the worn material surrounding it, this latter having to be cut away during the process of patching. The selvedge way of the patch and garment must run parallel; the patch must lie perfectly flat when finished.

The three different kinds of patches taught in the Elementary Schools are:—

(*a*) *Calico patch.*—The patch is placed on the wrong side of the garment, and is hemmed down on to it. The patch and garment are seamed together on the right side. The corners on both right and wrong sides must be kept perfectly square.

(*b*) *Flannel patch.*—Here again the patch is placed on to the wrong side of the garment, but another difficulty presents itself which does not occur in any other patch. The nap, in patch and garment, must fall in the same direction when stroked with the hand. The patch is herringboned down on to the garment on the wrong side, and great care must be exercised in turning the corners, to keep them perfectly flat; on the right side, the garment is herringboned down on to the patch.

(*c*) *Print patch.*—This differs from the foregoing patches, insomuch as it is placed on the *right* side of the garment. In placing the patch, the pattern of the material should match that of the garment as nearly as possible, though, if the design is complicated, this will sometimes prove a difficult matter. The patch is very neatly seamed on to the garment on the right side; on the wrong side, the worn part of the

garment is cut away to within $\frac{1}{4}''$ of the seaming stitches showing through from the right side; the raw edges of the garment and patch are blanket-stitched together, but none of the stitches must be seen on the right side. If properly worked, the patch will be almost invisible when the garment is worn.

2. DARNING.—This is the method used for renovating a thin place or a hole in a garment, by weaving strands of thread between those of the garment, the darning thread being of the same texture as the threads of the material.

If the darning is for a thin place, it should follow the direction of the selvedge; if for a hole, the selvedge direction should be followed first, and then the weft way. Small loops of the darning thread should be left at the end of the rows, to allow for shrinkage. All darning should be worked on the wrong side of the garment, with the exception of the "stocking-web stitch" darn.

IV. Knitting.—This is quite distinct from the first three sections, as it begins with a thread only for its basis, the fabric being worked by means of this thread and knitting-needles (two pointed ends) or knitting-pins (one pointed end).

Before knitting is taught to young children, they should know how to hold the needles for working, and the different movements needed to make a complete stitch. For this purpose the teacher should have two large wooden or bone knitting-needles, and make the children go through the different steps in the form of a drill. When once the drill is thoroughly mastered, the actual knitting with the thread will be comparatively easy.

The young teacher may do well to take the following table as a simple guide for teaching plain knitting to little ones:—

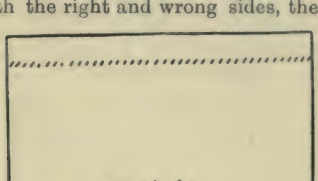
1. Needle in. 2. Thread round.
3. Pull needle through loop. 4. Slip loop off.

The above steps must, of course, be illustrated before the children, and they should be permitted to count aloud while working a few stitches simultaneously.

Stitches in Brief.

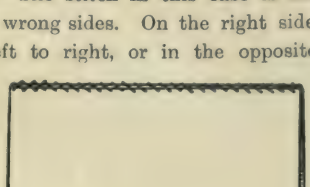
It is impossible to deal at any length with all the different stitches used in plain needlework, but their chief characteristics are set forth.

1. **Hemming.**—This is the first stitch taught, and is, perhaps, the most difficult in which to obtain perfection. The stitch is slanting on both the right and wrong sides, the slope being at



an angle of about 45°, and in the direction of right to left. In order to obtain the correct shape of the stitch, the work must be held across the first finger of the left hand and at right angles to it; when inserted for a stitch, the needle must run by the side of the thumb. Hemming is used for holding down folds or hems, and is usually considered a "wrong side" stitch; it is known as "felling" when used in connection with seams. It is worked from right to left.

2. **Seaming.**—The stitch in this case is not the same on both right and wrong sides. On the right side it is slanting, falling from left to right, or in the opposite direction to

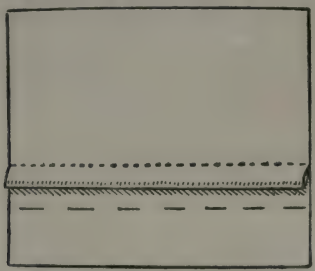


RIGHT SIDE.

hemming; on the wrong side it is perfectly straight. The work must be held between thumb and first finger of the left

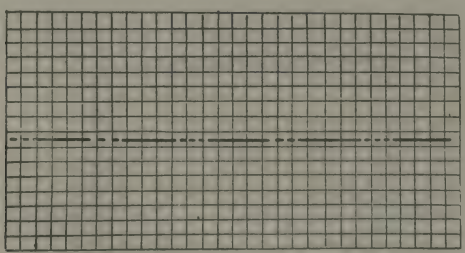
hand, the latter being kept quite straight; the needle must be inserted at right angles to the seam for every stitch, in order to get the correct shape. It is worked from right to left, and is usually considered a "right side" stitch. It is chiefly used for seams.

3. **Running.**—This process consists of horizontal stitches, which should be about two threads in length on both right and wrong sides. It is used for tucks, when it should be worked on



the under side; and for seams in place of seaming, when the garment is of fine material such as nainsook; and for flannel seams.

4. **Gathering.**—This stitch is almost invariably worked across the selvedge way of the material, and always on the

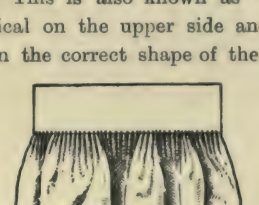


right side; usually on single material when it is set *into* a band or yoke, but on double material when set *on* to a band, *e.g.*,

the skirt of a child's frock. The stitch is horizontal, and in medium calico four threads should be passed over and two taken up on the needle; in other words twice the amount is passed over that is taken on the needle. It is used to make a greater space fit into a smaller.

5. **Stroking.**—This is simply the process by means of which the gathers or little rucks are arranged smoothly, side by side. It should be done with the eye of a darning needle or a blunt-pointed wool needle. Each gather must be stroked for the depth of ¼" below the gathering thread. It is done on the right side of the work.

6. **Setting-in.**—This is also known as "stocking." The stitches are vertical on the upper side and slanting on the under. To obtain the correct shape of the stitch, the needle

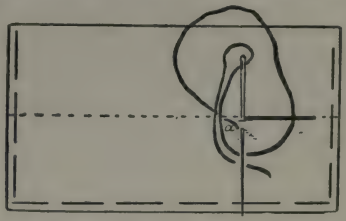


SETTING-IN.

must be inserted directly below the point from which the cotton issues for the preceding stitch, and slanted until it is above the next little ruck. One gather only must be picked up at a time and about two threads of the band. The easiest way to set-in gathers is to turn the work upside down, so that the right-hand end of the work is towards the left hand.

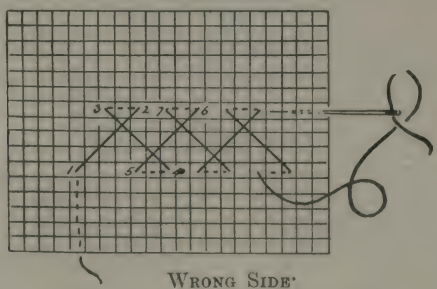
7. **Buttonholes.**—These should always be cut the selvedge way of the material where possible. If at the end of a band, they should be worked with one round end—outside—and one square end—inside; if for the front opening of a garment,

they should be worked with two round ends or two square ends. The stitches should be about four threads deep and one thread apart; the knot at the top of each stitch is formed by passing the double cotton from the eye of the needle, under



the point from left to right, and the needle and cotton are drawn through at right angles to the cut. The round end of a buttonhole consists of nine unknotted stitches in order that the shank of the button may fit; the square end consists of nine knotted stitches. Buttonholes are worked from left to right.

8. **Herringboning.**—This is another of the few stitches which are worked from left to right. It is so called because it somewhat resembles the backbone of a herring. On the

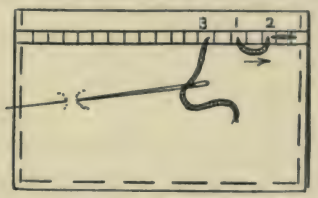


WRONG SIDE.

wrong side the stitches are oblique, extending for a depth of four threads; on the right side the stitches are horizontal,

two threads in length, with two threads between. Herring-boning is used for flannel and flannelette garments in place of hemming, as no second fold is turned down, on account of the material being too thick.

9. **Stitching.**—Also known as back-stitching, as a backward stitch is made at the same time as the forward stitch; the



former on the right side, the latter on the wrong. On the right side the stitches are exactly end to end, and two threads in length, while on the wrong side they form a cable, and are four threads in length.

The process is used to give greater strength to seams, especially for bodices where the open seam is used, and also for ornamental purposes. It is worked on the right side of the garment, from right to left. When worked in a straight line, it is better to draw out a thread of the material, in order to keep the stitching more regular, as an uneven line would be worse than none at all, and instead of adding beauty to the garment, would detract from it.

(B. L. B.)

CHAPTER XIV.

The Language Arts.

I.
READING METHODS.

THE two main questions relating to the teaching of reading remain as unsettled as ever. "*When should reading be taught, and how?*"*

When to teach it.

Professor Dewey and other educational radicals are emphatic in urging a postponement of the time when this subject is first to be systematically taught. "Things before words," these reformers repeat. Mere words tend to inflate the mind, to destroy reverence for reality. Moreover, every hour devoted to their learning means an hour subtracted from manual training, nature study, art, history, science—subjects rich in content and meaning, and therefore all-important for the early introduction of the child to the universe into which he has been ushered. An interest in reading and writing is an artificial interest, for both arts are conventional, and therefore mechanical at bottom; an artificial interest is necessarily an isolated one, and consequently difficult to maintain, except by adventitious means ("mediate interest," Vol. I., p. 82). Physiologically, also, reading and writing are undesirable for young children; they lead to premature eye strain, short sight, etc. Thus, in the opinion of Professor

* The opening paragraphs of this chapter are largely based on Chubb's *The Teaching of English.*

Dewey, the age of eight is quite early enough for the systematic teaching of reading and writing.

These arguments are weighty, but not quite conclusive. The divorce of "words" from "things" is certainly, at first sight, undesirable or pernicious, but it is not an inevitable feature in the teaching of reading and writing. "Things" may be kept close to "words," and both words and things may benefit from the proximity. Again, it is not certain that the "conventional" nature of written and printed signs is any drawback. The man who knows their history may very well reverence rather than despise them; words are as full of "romance" as other inventions of men; and certainly the child does not recognise them as artificial in any bad sense; rather, he himself wishes to learn them if he has been brought up in a proper environment; he would fain get the key to the mysterious hieroglyphics of the adult around him. Such a desire—such an "interest"—is only "artificial" in the sense that it would not arise except in civilised society. But it *does* arise of its own accord in the breast of the modern child, and "at an earlier age than eight."* By the use of large letters, etc., any physiological danger can be obviated.

The Two Views.

Here, then, are the two sides of the question. Radical reformers like Professor Dewey lay stress on the spontaneous and apperceptive interests of the child, and would postpone the teaching of the two literary arts until the child has accumulated a mass of experiences of another kind, and is ready and eager to widen these experiences by reading books and writing down his ideas. Thought, say these reformers, is more important than the mere apparatus of its expression, and the latter should always be kept subordinate to the former.

On the other side are the moderate conservatives, who urge that the child undoubtedly finds a certain pleasure in merely mechanical and routine tasks, especially if these are

* Dr. Stanley Hall.

along the line of adult accomplishments, and that this pleasure, or interest, may well be employed in acquiring the technique of reading and writing. He learns the control of an instrument, a set of tools—namely, the letters and words employed in books; and if he can only acquire this power quickly enough, he is equipped with the means of conquering all the realms of literature. The thing would be worth doing (say the moderate conservatives), even if we had to throw to the winds all appeals to the child's interest. But we need *not* throw them to the winds; the child is quite willing to learn to read and write, and so long as we do not sterilise the curriculum by neglecting the vital factors emphasised by Professor Dewey—nature study, etc.—we may very well give a considerable time to the two conventional arts. Furthermore, they had better be studied in considerable isolation, not incidentally or in correlation with other subjects, for the child must learn "one thing at a time," and conquer obstacles in succession. Some infant teachers in town schools are convinced, too, that, if the literary arts are postponed there would be considerable difficulty in filling up school time; stories and nature study cannot be continued all day long!

I see no likelihood of a settlement of this sharp controversy for many years to come. Broadly speaking, the view of Professor Dewey coincides with that of the Fröbelians and Herbartians, with their stress on spontaneous and apperceptive interests, on content rather than on form, on meaning rather than on routine, on life rather than on mechanism, and, consequently, on sentence rather than word. But, to admit this is not to settle the question finally. Reading is so important an art—introduces to so much—that a plan which "prematurely," though efficiently, gives the child power over this art, and therefore over all the riches of literature, may be fully worthy of consideration, and perhaps acceptance.

Such a plan may conceivably involve the teaching of words as words—words apart from their meaning. This divorce is, doubtless, undesirable in itself, and yet, if it works well in the end, it may be preferable to a plan more apparently "educational."

In England, at any rate, there is no likelihood that Professor Dewey's heroic proposal to postpone the teaching of reading until the age of eight will be accepted for many years to come. The business of the teacher must therefore be to accept and employ whatever seems good and feasible in the rival plan. He will give ample nature study, occupational work, and the like; he will tell or read stories and poems to the children, thus introducing them to real literature through the mouth and not waiting until they can obtain it from the printed page; he will encourage them to narrate and converse and thus gain power over the sentence—the real unit of speech. But at the same time he may be "teaching reading" by "word" methods of a highly systematic and phonetic character, and many of the words taught may be perhaps meaningless to the children. So long as the teacher knows what he is doing, and recognises that in the end "form" must be subordinated to "content," and words to things or thoughts, he may be justified in pursuing methods which temporarily violate this principle.

The teacher must remember, however, that some children are predominantly eye-minded, others ear-minded, others motor-minded (visiles, audiles, motiles), and consequently that various and in a measure conflicting methods of instruction may be legitimate, in order to ensure multiplicity of appeal. Or, best of all, some method that links the best elements of all systems together may be evolved. Many teachers think that Miss Nellie Dale's method realises this ideal.

Yet, as reading is unquestionably the most valuable subject that can be taught in any school (let none of our

reformers persuade us to the contrary!), it is important that we should be agreed as to the best method of instruction, even if we quarrel as to time. *How* should we teach it?

How to teach it?

I answer at once, "I do not know." I am not convinced, in my own mind, that any one of the suggested methods is more obviously, scientifically, or finally correct than another. For a time I was prepossessed (mainly on theoretical grounds) in favour of the "look and say" method, which takes the word as the unit; and my feeling toward the Dale system, when I saw it applied in schools, was one of crude revolt. It seemed so highly artificial, it seemed so contrary to the course of racial evolution, it seemed to raise abstractions (the mere sound of letters), to so prominent a place (in opposition, as I thought, to pedagogical principles), that I believed the system to be fundamentally bad. If we had to endure a syllabic system at all, let us have a reasonably simple one; the Sonnenschein system was surely better than the Dale. But was *any* syllabic system right? Is the child "logical" as Miss Dale asserts; does it start with single sounds?

Such were some of my thoughts, if the name could be given to them. True, I had, in years gone by, known something of teaching a "Standard O" to read, but they had been "taught" by the "alphabetic" method, and no thought of using any other had crossed my mind. "Phonetic" and other methods I had begun to hear about, but I never took them seriously.

At the present moment, with a good deal more knowledge and experience, I feel very uncertain whether we are really in possession of the final method of teaching reading. The nearest approach to it, however, is almost certainly the Dale method.

Upon one point, however, it is necessary to be emphatic at the start. *Even though we decide that "power to read" must be our first aim, this "power" has no final moral value*

whatever. Critics of our educational system often assert that, in spite of all the schools that have been equipped during the last forty years, the youths of our country are not much better than their predecessors. "What has been the good of teaching them to read?" *None whatever, unless we have aroused an interest in reading, and little even then unless that interest is in books of a good, or at least an innocent, quality.* It is of the most vital importance that every teacher should keep in mind this distinction between interest and mere power. We were compelled to ignore it for thirty years by a certain "Code" (1861), which insisted on the "power" and said nothing about the "interest." But in these days we should judge the success of a school, in teaching reading, by the number of good books its pupils have voluntarily and enjoyably read.

I say "mainly," but not "entirely." There is a new danger looming up, though not in the immediate distance. I can conceive of a school so animated by the idea of "interest" that, by the encouragement of home reading and silent reading, most of its pupils have become acquainted with a wealth of books, and have thus acquired wide knowledge, keen intelligence, and large powers of "composition"; and yet the school may not be fully successful in "teaching reading." The boys may stumble and mumble when called upon to read a paragraph. In other words, technique, accuracy, skill, have been forgotten, though "interest" has been remembered.

There is still, therefore, an important part to be played by the old canons of judgment. We have to teach the mere technique of reading, or at any rate of speech, as well as arouse an interest in books. Probably, too, we have to teach reading *as quickly as possible.** Any *quick* method, analytic or synthetic, must be a fairly good method, provided that quickness is not gained at the expense of other essential qualities. As I have already hinted, an extremely quick method *might*

* Not necessarily *as early as possible.*

be tolerably acceptable even if, for a time, the children learnt words *without any precise reference to their significance.* This sounds like heresy, and I do not urge it dogmatically. No doubt "Things before words" is, on the whole, a sound and sensible maxim, and should check us from insisting too early upon the acquisition of an artificial art like reading; but once we have decided to teach such an art, our aim should certainly be to conquer its difficulties as soon as possible. But while the mechanical art is being mastered, there should be ample story-telling by the teacher, and plentiful learning of suitable poetry; the teacher, too, may frequently read from an interesting book, in which way the children will learn that books contain a fund of pleasure, which will soon be theirs, if only they learn to read. This *may* be a better method than to try, sentence by sentence, to teach the meaning of all that the child is wearily deciphering. There is danger in teaching words merely as words, and I would not urge the plan too far; but so important is it to get over the mechanical difficulties quickly that a teacher of little children may well sacrifice a good deal in that cause. Now, however, that Miss Dale has shown us how even the early stages of an apparently arbitrary art like reading can be made interesting, the problem is nearer to a solution.

I differ, therefore (though not dogmatically), from Professor Welton, who insists* that the visible symbol must at once call up an idea. The word, for him, is the unit; the letter is an abstraction. Certainly the letter is an abstraction; I admit that my pedagogical "instincts" were in favour of some such method as he (all too briefly) advocates; but it is allowable to think that any quick method is likely to be a good method. Moreover, I do not see how, if the word is the true unit, the child can attach any meaning to relational words like *the*, *on*, etc.—a point to which Professor Welton does not refer.

* *Principles of Teaching*, pp. 116-9.

The difficulties in the way of teaching English reading and spelling have been pointed out over and over again. On the whole, they have been exaggerated—at any rate, when *reading* (not spelling) is under consideration. We are told that there are 800 monosyllabic words of irregular form in common use; that our twelve or thirteen vowel sounds are represented in over one hundred ways; that there are many silent letters; that combinations like *ea*, *ow*, and *ou* are pronounced in various confusing ways (h*ea*rd, h*ea*t, h*ea*d, id*ea*, cr*ea*te; h*ow*, bl*ow*, s*our*, y*our*, hon*our*, f*our*, s*ou*l, pi*ous*); and so on. In point of fact, however, many of the anomalies are simple examples of subordinate rules; for example, the change in the sound of a vowel brought about by a terminal *e* (f*a*t, f*a*te), and the modification in the sound of *a*, when preceded by *w* or *wh* (compare h*a*t, wh*a*t).

Difficulties.

I now proceed to a brief discussion of the various methods of teaching this subject, viewed as a mechanical art.

(1) There is first the old "alphabetic" method. Each letter is called by its conventional name—Ay, Bee, Cee, Dee, Ee, Ef, and so on; and then easy words are taken, of similar construction, and are spelt and learnt.

Alphabetic Method.

Cee, Ay, Tee —Cat.
Aitch, Ay, Tee—Hat.
Eff, Ay, Tee —Fat.

Reading books are provided, but, though these are graduated, there is no very definite system in the gradation, except that of length of words.

Objections have been frequently alleged to this method. The name "Aitch," we are told, does not suggest an aspirate; the name "See" does not suggest the hard sound of C (as in cat), though it is effective in suggesting the soft sound (as in cedar). The letter names are arbitrary, we are told.

Of course they are, but so are the letters, and so, at the present day, at least, are almost all words. Why call a certain

familiar quadruped a "dog" at all? Why not call it a "bik" or a "julu"? Why represent one consonantal sound by "b," and another by "t," instead of reversing the order? Reading and writing are based on arbitrary signs (though doubtless the signs may have been once of the nature of pictures), and it is no very grave objection to the alphabetic method that its letter *names* are arbitrary.

The plain truth is that the alphabetic method was contemporary with the early days of education—days when the preparation of reading books had nothing like the present-day care bestowed on them; when teachers were the failures of other callings, and when, in short, education was a Cinderella among the professions. Thus, the alphabetic method never had a fair chance. When those days began to pass, the superficial faults of the alphabetic system became noted by all intelligent teachers, and every book on school management must now needs piously refer to them.* But I doubt not that if the same care and intelligence that have been devoted by Miss Dale to her phonic system had been devoted to the alphabetic—if difficulties had been *graded* as carefully—the results would be *almost* as good. The arbitrary names of the letters really matter very little; indeed, these very names are frequently re-introduced by teachers of the phonic system. Children are not logically minded, and a perfectly logical system of teaching an illogical and arbitrary art like reading is not absolutely necessary.

Another objection, that the alphabetic method takes the letter rather than the word as a unit, is equally applicable to the phonic method. I have already replied to the objection. Any method that is efficient is a *good* method, and even if "unpsychological" when judged from one standpoint, must be "psychological" in a wider sense.

* Very much the same has happened with regard to "moral instruction." The phrase usually calls up the image of some eighteenth or nineteenth century young ladies' academy—Miss Montflathers's, perhaps, in *The Old Curiosity Shop*—rather than the image of the up-to-date teacher using history, literature, art, and the Bible, to build up the conscience.

(2) The "phonic" system is generally regarded as an improvement on the alphabetic. The *sounds* of letters are learnt, and these, being run together, are found to form words.* The plan has certain advantages. First, it tends to overcome the slipshod or incorrect pronunciation of the average English child. The London boy, for example, rarely does justice to the letter *t*, when medial or final; "butter" is pronounced "bu'er," "it is" "i' is"; similar injustice is meted out to the guttural sound in "ask," to the dental in "strict," to the aspirate, and to the *th*. The phonic system lifts consonantal sounds into prominence. Vowel sounds, which are perhaps even more troublesome in the districts where the "Cockney" dialect prevails, would certainly be purified by a phonic system, provided each teacher (especially in infant schools) were trained to pronounce them in some standard way. But the vowel sounds in "no" and "came," and to a less extent the vowel sound in "fine," are causes of much trouble, and it behoves us all to examine scrupulously our own pronunciation of them.† In other districts of England, different difficulties have to be faced. The *r*, for example, is troublesome in East Anglia.

Phonic System.

Again, there is no doubt that when carefully carried out, the system enables children to recognise unknown words of considerable length, provided these are of regular construction. This is especially noticeable, as I shall presently point out, with children brought up on the Dale system. On the other hand, such words generally stand for ideas somewhat beyond the children's comprehension.

There are, however, certain objections to any "phonic" system. Consonants, we used to be told, cannot be sounded alone. The statement is sometimes denied; nevertheless, attempts to give the sound of a consonant by itself generally

* This is not the place to discuss the use of phonetics in the teaching of French and German. I would only call the attention of primary teachers to the fact that many modern language teachers use the system extensively.

† The best account of present-day Cockney vowel sounds is found in Bernard Shaw's preface to his play *Captain Brassbound's Conversion*.

fail at some point or other with children, who add a kind of obscure vowel sound to the consonant. Thus they pronounce "p" like the "pu" in the word "putty." In other words, they commit the very fault commonly alleged against the "alphabetic" system. In London schools one notices the two systems jostling with each other, and testifying to each other's virtues. Thus, even where the Dale system is taught, the old alphabetic names are often learnt, and the "letter" is described as a sort of talking animal; "P says pu." If, on the other hand, the teacher resolutely forbids the addition of any vowel sound to the consonant, there is said to be some danger of producing or encouraging stammering.

The more fundamental objection alleged against the phonic method has been referred to already in connection with the alphabetic, to which it is equally applicable. The word, not the letter, is the unit of speech, we are told. But this statement itself is open to criticism. I have pointed out that words like "of," "the," "because," are not units of speech in any true sense. The common experience of hearing foreigners' speech, or of reading foreign books, testifies that we can often understand the drift of a sentence, even though we may be ignorant of several of its words; nay, though English proof sheets may have words missing or incorrect, the sense of every sentence may be perfectly apprehended. "A letter is an abstraction"; yes, but so is a word. In short, it is no good for us to be too severely logical in teaching our inconsistent system of English word-signs; if by any such attempt we keep children longer on the road than is absolutely necessary, we show ourselves to be pedants. Mr. Sonnenschein boldly contends that the *syllable* is the unit of speech! But, whether we take letter, syllable, word, or sentence as the unit of speech, matters little in itself. Our attitude towards reading should be a severely practical one; which method produces the best results? I pass on to consider in general terms two other schemes for teaching reading before

giving some account of the Dale and Sonnenschein methods, which, at the present day, seem to win an increasing measure of favour from teachers.

Phonetic Method.

(3) A method which makes use of an artificial alphabet of its own, corresponding to the forty-five or more sounds of the English language, has not, to the best of my knowledge, come into any extensive use in English schools, and there are strong reasons against it. For foreigners, studying English privately, and needing to be constantly safe-guarded against erroneous pronunciation, such a system is useful; similarly, though to a less extent, for an English student reading French or German.* Moreover, one can conceive of a school being equipped with a whole series of reading books printed in the artificial alphabet, and of the children being, in this way, rapidly introduced to good literature. But I would urge first that good literature is easily accessible to young children even now—through the mouth of the teacher; and, secondly, that it is a grave blunder to introduce children to a *second* artificial (though regular) system of signs, in order to stave off temporarily the difficulties of the first artificial (and irregular) system. There must arise a confusion between the phonetic words and the ordinary words; the "presentative activity" of the former (to use an Herbartian phrase) must constantly be a source of embarrassment. It is for this reason that a teacher should rarely, or never, put an incorrectly spelt word on the blackboard, or allow such words to stare the children in the face from their exercise books.

The preceding methods have been "synthetic," or "building-up," methods. I now turn to one that is analytic, proceeding from whole to parts.

(4) The "Look and Say" method—new words being looked at as wholes, named repeatedly, and thus gradually learnt—has proved itself, generally speaking, a failure. Men with

* Paul Passy's books, *e.g.*, *Le Français Parlé*, are of this description.

a psychological training may feel prepossessed in favour of a system that regards words, not letters, as the units of speech; and, no doubt, the adult does not minutely examine the words he is reading; he takes them as wholes, and may even fail to notice omissions of a letter from a familiar word. As we first learn to recognise horses, men, trees, etc., as vague wholes, and only gradually learn to observe their minute parts, should we not learn words in the same way? Indeed, pathological evidence, *e.g.*, "Lowenfeld's case," goes to show that words are often so treated. At first sight, then, a case can be made out in favour of the "Look and Say" method, which is, however and moreover, by no means the *new* thing it is sometimes supposed to be; it was in use decades ago in this country, and is, of course, the only possible method in China. But it is a method which, when used by itself, appeals to the mechanical memory alone; it gives no power to grapple with unknown words—at least, it does not *aim* at producing such power, though, incidentally, it does produce a little; and its results are, generally speaking, unsatisfactory. Spelling and writing should be learnt along with reading; the "Look and Say" method, on the other hand, is concerned with reading alone, though, doubtless, writing could be combined with it. Confusion between words like "from" and "form" is inevitable if the method is used alone.

"Look and Say" Method.

That there is a certain limited value in the "Look and Say" method is nevertheless true. Children who have acquired general reading-power on the Dale system may very well be subsequently taught (or rather, "told") anomalous words; in Sonnenschein's method, too, the device of "Look and Say" is employed with small words at the beginning. If words were properly grouped, the method might possibly be effective, within certain limits.

After these general remarks on the three or four "methods" which lie at the basis of all "systems" of teaching reading,

I proceed to consider the two favourites among those systems.

The Dale System.

The existence and the success of Miss Nellie Dale's system are testimonies to a fact of which Herbartians sometimes need to be reminded, namely, that it is quite possible to create "interest" even in what seems the most unpromising material. What could be drier to a child (one imagines) or more removed from life than the symbols that constitute our alphabet and the separate sounds of which our words consist? One's first impulse is to say, "Teach reading, at all costs, *rapidly*; get away as quickly as possible from these beggarly elements." One's second impulse is to say, "Postpone the teaching of reading until the child, like Fröbel's 'Lina,' feels a desire to read, an *interest* in reading." Miss Dale has shown that there is yet another way. The beggarly elements themselves can be made interesting. The child's mind, opening to the innumerable objects around, does not feel any adult aversion towards letters; does not recognise that, while a daisy is "natural," a letter *p* is "conventional." Fortunate for us as teachers that this is so. Children, as the *Suggestions* say, "are very easily interested in the observation of the sounds they make."

In Miss Dale's system, ample use is made of the child's tendencies towards activity, dramatic and imitative; its passion for "adventure," for finding out things; its love of colour and of pictures. The moral element, too, is prominent, the system affording multitudinous opportunities for the practice of sundry social acts. Self-reliance is cultivated; children taught on this system being able to decipher long, though regular words, with great skill; they are not permanently paralysed by the irregularities of our language.

Miss Dale's system is based on phonetics, and is thus related to one of the most promising of recent features in modern language teaching. Sounds are *discovered* before their

alphabetic signs are given by the teacher. Writing is taught simultaneously with reading. Difficulties are carefully graded, short vowels and regular forms, of course, coming first; the knowledge of these "makes children keenly observant of irregularities," for the explanation of which last the aid of history and geography is often called in. In consequence of this grading, dictation (of regular words) is possible from the first. By means of the tabulating frame, children are made to exercise thought in taking down and replacing the sundry letters used in word-building. The sounds, not the names, of the letters are learnt. After words have been built up, the teacher tells stories which deliberately introduce these words; the meaning may also be represented by dramatic action. The children may then print their words ("muscle-memory" again!) by means of coloured chalks, the left, as well as the right, hand, being used; they may draw pictures to represent the words, and hunt up both words and pictures in the reading book.

The simple device of using definite colours in a uniform way for the various kinds of letters adds greatly to the charm and utility of the system. The letters thus, and in other ways, become invested with personality. C may be a "fat baby," TCH may be a "sneezing sister"; voiceless and voiced consonants are sisters and brothers, dressed respectively in blue and black. Vowels may be "stepped," silent letters may be drawn in the air. The lips are the "front door," out of which these sundry personalities emerge. The two "sisters" C and K are very fond of each other (*cf.* the words *pack*, *stick*, etc); H is a lonely sound, and sighs because of its very loneliness; PH is a traveller from the very far-away land of Greece.

After the letters are learnt and associated with their most usual sounds (the *short* sounds in the case of vowels), the "primers" are used. These books, illustrated by Mr. Walter Crane, introduce the children to Pat, Dan, and sundry

other sentient beings who rapidly become good friends of the children; Dan's taste for natural history affords a link between the reading book and nature study; thus sundry "cosy chats" are rendered possible, which help to drive home the impression that words are not meaningless inventions, but stand for real things. Sand-modelling and drawing by the children, kindergarten songs, and so forth, can be further employed whenever any word is dealt with that suggests such treatment. Various common combinations of letters (*e.g.*, *-ink*, *-ish*, *-inge*) are dealt with in succession.

The only obvious criticisms of the system which I have all too briefly described are not, perhaps, of much importance. At first sight, it seems over elaborate, over analytical, over logical (children are made to distinguish carefully between, say, the hard and the soft sounds of *x* in *mixture* and *exact* respectively); nature work, elementary geography, and other subjects, seem to follow somewhat artificially the sequence of the Dale reading books (when the word *ink* and its relatives *brink*, *drink*, etc., appear on the scene, the teacher gives a lesson on *ink*; when the word *tilt* and its relatives appear, the children are introduced to south-western France, where men go on *stilts*); the power over long words conferred by the system is not so very valuable after all, for young children do not need, or understand, long words; while the postponement of long vowels renders many common words unknown to the child in the earlier stages of his progress. Again, unless *all* schools take the Dale system, there is the great difficulty of the migratory child, who will find himself quite confused when he is brought face to face with an elaborate system rather different from the one he has previously learnt.

I do not claim that these "objections" are worth much, when balanced against the many and great advantages of the system. In fact, I am sure they are not. Miss Dale has undoubtedly "turned the arid, tearful desert of the spelling and reading lesson into the most enchanting of fairy gardens." There is immense variety in the method; arms, hands, legs,

tongue, ear, eye, are all used; every one of the so-called mental "faculties" is appealed to; words, pictures, stories, objects, all play their part. Above all, the system undoubtedly confers *power* on the child—the power to read, quite unaided, any unknown but regular words (*e.g.*, "considerable").

Sonnenschein Method.

The Sonnenschein method is less celebrated and less elaborate than the Dale. It commences with short vowels, preceded or followed (or both) by single consonants (at, bat, etc.); it goes on to the same vowels, preceded or followed (or both) by double consonants (prim, snap, etc.). Then come double vowels and diphthongs of regular pronunciation (food, boy, etc.); lastly, long vowels (fate, etc.) and anomalies. The stress is, perhaps, rather more on syllables than in the Dale system; in fact, the author expressly claims that "the true elements of words are syllables." "Word-building," too, is prominent; "to see the word grow on the blackboard is as interesting to the children as when, at a later stage, they see in the study of geography the local map expanding on the blackboard." As in the Dale system, children learn letters partly by printing them. A few short anomalous words are introduced from the first, and learnt by "Look snd Say."

It is claimed that this method, like the Dale, enables children to read long but regular words without difficulty; we are told of children of five years of age being able to read a column of the *Times*; and the author of the method does not hesitate to call it "Reading in a Twelvemonth."

In connection with both the Dale and the Sonnenschein methods, the conventional names of the letters of the alphabet are often taught, sooner or later. The usual device is to make the children regard the letter as a being who speaks; "B says 'b'" (at 'b' they give the mere consonantal sound). Often, however, the consonantal sound takes after it an obscure vowel sound, identical with that in "but"; this practice almost amounts to the invention of a second conventional alphabet, and is perhaps to be deprecated.

II.

THE READING LESSON.

THE fifth chapter of this book dealt with "Literature." It was deliberately separated from the present chapter on the language arts in order to impress the fact that literature may be taught largely through the ear, as, indeed, has often been the case in many countries where the story-teller or minstrel has plied his trade. But not only can literature (fortunately) be taught apart from reading, reading (unfortunately) can be taught apart from literature. That is to say, we can make a boy read aloud with considerable distinctness, energy, and "expression," while all the time he knows and appreciates nothing whatever of what he is reading. Here comes in the value of silent reading, especially when it is guided by a series of questions which will ultimately have to be answered. But such guided silent reading is, perhaps, most suitable for home work, and I propose here to deal with the more common type of reading lesson. No doubt I shall overlap Chapter V.

The reading lesson has two distinct sides—sides that are already familiar to the reader of this book. There is the impressional side, and there is the expressional. The boy has to take in knowledge, and then he has to express it, not, however, in his own words, but in the words of the book from which the knowledge is acquired. This fact indicates that reading aloud is a less original exercise than "composition." "Why, then, retain it?" The more one looks at the question, the more one doubts whether reading aloud should have any important place in school work. Possibly "reading" will have to trifurcate: there will have to be (1) much private reading along the lines already suggested—reading for the purpose of acquiring knowledge; (2) much free oral composition, in which clearness, correctness, and fluency will be expected, just as

The Future.

they are now expected in the "reading lesson"; (3) much elocution or recitation, with books available all the time.

Nevertheless, "reading aloud" is a useful exercise (if only there were more of it in our family life!), and I will assume that we retain it in our schools. Much can be effected; innumerable problems can be solved, innumerable errors pointed out, innumerable hints dropped, in connection with this subject. The main danger is that passages and poems of high merit may be degraded into mere "reading exercises" for mumbling and stumbling boys; and I would urge again, if for the twentieth time, that great passages and poems must be taught mainly through the ear, if they are to be taught at all.

The "reading lesson," then, is proceeding, and the passage is one of merely moderate merit—perhaps, out of the "history reader."

A boy reads; the teacher asks him whether he should stop or not stop at the word "which"; the boy answers. Another boy answers to the contrary; a third boy tries the sentence, and at last a decision is arrived at; he *should* stop there.

What is the emphatic word in the sentence? One boy suggests "through," another "frequently." A short discussion follows on the subject-matter, and at last the class decides that "frequently" should be emphatic. How is emphasis shown? By modulation or by a pause.

A clumsily printed sentence occurs, a semicolon in place of a comma is needed; and the teacher seizes the opportunity to point out that writers and printers are not infallible. An excellent rule would be to ignore printed stops altogether and to invent one's own.

"The judges' decision was made known through the country." The class has been reading of Charles I.'s dismissal of the Lord Chief Justice, and the question is now asked whether the reference is to one judge or to more than one. Some boys, with the Lord Chief Justice in their head, will

answer "One"; but others will note that the apostrophe is decisive for the plural.

The question whether present-day judges are removable is suggested. Ought they to be removable? Yes. No. Why? Bribery, tyranny, etc. Who has heard of an unjust judge of recent years? What kind of judge is most likely to take bribes, one who feels secure or one who feels insecure? If plenty of time is available, the question may be thrashed out; if only a little, the problem may be noted for future solution.

The first reference to Wentworth occurs: he is imprisoned by the King for contumacy. The teacher throws out the question of what will be his later history. Speculation is aroused. Perhaps one boy knows that "Strafford" was ultimately executed. Thus there arises the problem of Wentworth's life between the two events.

A boy says "goverment" for "government." The teacher writes the word on the board, and makes several boys spell and pronounce it.

A Latin phrase occurs; dictionaries are produced and its meaning ascertained. It is an important phrase, so it is either entered there and then in a note-book or placed on the blackboard for future entry.

A reference to the "Baltic" and the cardinal points occurs. A boy is called upon to verify the reference on the map of the world, which, *of course*, hangs on the wall.

A passage involving "parenthesis" occurs, and produces temporary trouble. The teacher reads the passage *minus* the parenthetic part, and the class perceives the continuity. He then reads it again with a marked change of tone for the parenthesis, and calls upon a boy to follow suit. Two or three words upon the functions of "brackets" follow, and perhaps the class is invited to add a parenthesis to a given sentence. ("Oral composition.")

A poetical quotation occurs. The teacher at once reads

this to the class, and reads it *well*. Poetry is not a subject for frequent and stumbling experiments.

A boy mistakes a word and substitutes another for it. "Was that a bad mistake?" the teacher asks the class; and at last the decision is come to that it was *not*, as the sense of the passage was preserved and the reader had clearly been thinking as he read. Such "mistakes" are worth the making.

A "metaphor" occurs. The class describe it as such, and, at the teacher's direction, change it into a "simile." A "mixed metaphor" is criticised, and a "climax" identified.

An ambiguous word occurs; its two senses are referred to; sentences are "educed" in illustration.

A sentence with sundry inversions or suppressions is rapidly analysed into subject and predicate, and placed on the blackboard.

One boy reads a paragraph badly—it contains several new words. Instead of passing on at once to a new paragraph a second boy is called on to read it, or possibly the teacher does so. Two impressions at least are desirable, and three are better than two.

A boy "drops his voice at a comma"; the teacher reads the sentence in two ways, with rising inflection and with falling, and asks the class which is preferable. The former *probably, though not necessarily*. "William came, and immediately set to work upon the task." Surely the voice is preferably dropped at "came."

A boy reads a passage involving "however," and reads that word as prominently as the rest. The teacher asks whether "however" is important; "Yes," "No." A boy is invited to read the sentence *minus* "however"; the sentence is still intelligible; hence "however" is not important, and should not be read emphatically.

A reference to the fall of Constantinople occurs; it is an important event, so its date is given, and perhaps a little

subtraction sum is worked. "How long ago?" The "line of time," or "chart of time," which, *of course*, hangs on the wall, is briefly referred to in confirmation.

An unusual construction occurs: "Then abruptly happened—an accident." The class is asked the reason for the inversion, and the sentence is straightened out in rapid "analysis."

A portion of the reading matter is in conversational form, and as a boy reads he fails to express this fact. The teacher instantly directs another boy to take the second part in the dialogue, and the lesson acquires a new meaning as the speech passes from one to another and back.

Another boy reads in wooden fashion. The teacher makes him pick out the "picture elements," or "ideal elements," and then himself reads, *stopping after each.* Then the rule is educed: "*Stop after pictures*"—a rule that would revolutionise our common teaching of reading, which seems based on three somewhat dubious dogmas; "Don't stop unless there is a stop in the book;" "Always keep up your voice at a comma;" "Always drop your voice at a full stop."*

Another boy reads pedantically; "CæsAR," "mountAINS," "chieftAIN"; the teacher directs him to speak naturally.

A piece involving description of rapid events occurs. The boy keeps the pace unaltered. Teacher hurries him up. When a slower piece occurs, the policy is reversed.

Alliteration occurs; teacher asks whether the boys have noticed anything peculiar; the function of alliteration is discussed.

. . . . .

Should the "reading lesson" be employed as an "information lesson"? The question is almost too ridiculous to ask, yet many heart-burnings have been caused by it. (*See* Vol. I. p. 1.) The answer is that it should not be used for the

* Of course the last two rules are pretty sound, though they are far from infallible. Another extraordinary dogma, is "Always emphasise adjectives" (!)

acquisition of fortuitous, unrelated information, but it should certainly be used for the acquiring of the subject-matter contained in the book that is being read; consequently, any hints that throw light upon this subject-matter *are* legitimate.

Should the "simultaneous" method of reading be adopted? In the early stages, particularly Standards I. and II., it may be occasionally useful, the pupils pointing to the words as they say them; there may also be competitions between one section of a class and another. But in simultaneous reading there is always danger of shirking and slovenliness, and if used at all it should be accompanied by eternal vigilance on the part of the teacher and constant individual reading on the part of pupils.

It is occasionally good for the majority of the class (and the teacher also) to sit with closed or reversed books, listening intently to the reader. The objection is that the majority lose a certain amount of practice in reading the printed words; but probably this objection is more than balanced by two great advantages: the reader is compelled to be distinct and expressive, and the hearers are compelled to think about the subject-matter.

The pattern reading of a passage is excellent, especially if it follows an unsuccessful attempt on the part of a boy, and a brief discussion of *where* the emphasis should fall, and similar matters. Direct imitation, sentence by sentence, seems undesirable; but the teacher may very well read a considerable number of paragraphs consecutively if there is danger of the "drift" being lost. This is particularly important if the passage or book be difficult; and I would here again refer to the urgent necessity that even in the highest classes of the school a certain amount of *easy* reading matter should be in use, so that feelings of pleasure and success may be frequently linked with this lesson.

III.

SPELLING.

SPELLING must be mainly taught incidentally. But the unfortunate fact is that the word "incidentally" too often means "not at all." If the ventilation of a class-room is attended to "incidentally," it tends to be forgotten altogether; and similarly, some schools which have abandoned "spelling lessons" altogether and relied upon "incidental methods," have begun to turn out bad spellers at an alarming rate.

Good spelling depends chiefly upon copious reading; bad spelling upon lack of reading. This is the explanation of the fact that the "spelling of Standard I." is so often adjudged bad. And the obvious remedy is to give "Standard I." plenty of the reading which it lacks. The same thing applies all up the school. Multiply the reading time by three or four, and encourage plenty of home reading, and the problem of bad spelling will be almost solved; it will tend to solve itself in the same way as the problem of "bad composition" will tend to solve itself. "Impression" must precede "expression" here as elsewhere; there is no "faculty of spelling" located in the mind or anywhere else; there are simply the memory images of words seen or heard; and if those images are too few or feeble, no amount of flogging the spelling faculty will avail at all. The "Look and Say" method, however, is bad for spelling, and if in use needs to be supplemented.

Badly spelt words should, as far as possible, be kept out of the sight of children. Not even on the blackboard should they be allowed for purposes of comparison or elucidation. Trust mainly to repeated mechanical pressure of correct forms on the eye. To write an incorrect form on the blackboard for the purpose of showing how it is incorrect, gives "presentational activity" (as I have already pointed out) to the wrong form. *Enhance the presentational activity of correct forms.*

When a new or difficult word occurs in the reading lesson or at any time, write it at once on the blackboard, have it spelt several times, have it (perhaps) written in a note-book, and make a point of introducing it several times in the course of the ensuing days or weeks. The meaning, of course, as well as the spelling, should be learnt at the same time, though not necessarily by means of a synonym. Ear, eye, and hand should all be employed, as some children are "audiles," some "visiles" and some "motiles." Though psychology and pathology have yet much to discover, there seems a strong case for spelling *aloud*; the auditory centre (*see* below) is highly important.

A few "rules" of spelling are useful, such as "*i* before *e*, except after *c*"; "when a word ends in only one consonant, this is doubled when other letters are added (*cot*, *cottage*), unless the consonant is preceded by two vowels (*wood*, *wooden*)"; "if the word has more than one syllable, the consonant is only doubled when the accent is on the last" (contrast *permitted*, *benefited*).* In the upper classes etymology throws considerable light upon the inconsistencies of English spelling.

"Word-building" in the lower classes has won a deservedly high place as a method of teaching spelling. But a good deal of time is commonly wasted over it. Thus a class may be made to spell over every letter in the following:—

W—INK.
S—INK.
SHR—INK.
TH—INK.
CH—INK.

Surely, after the first one or two words have been spelt, the INK can be taken for granted, and the new letters at once be prefixed without a repetition of the spelling.

* The words *seize* and *woollen* are exceptions to the above rules.

Some good schools retain a form of the old "spelling lesson," even in the upper standards. Head masters have been known to go through an entire dictionary, selecting all words that present difficulty, and then appointing a certain number of these to be learnt by each standard, year after year. In other schools, a small spelling book, like *Word-work*, is in use. Certainly an occasional lesson on contrasted words (*vane*, *vain*, etc.) is advisable. It seems at first sight a pity that these methods should be necessary; they are mechanical, and go counter to such principles as correlation and interest; but so long as English spelling is what it is, schools have to face the situation, and I believe that, provided the rest of the curriculum is intelligently co-ordinated, and the teaching of a stimulating kind, there is no real objection to the moderate employment of mechanical methods in a conventional subject like spelling. Besides, the teacher can constantly use a "mechanical" lesson for purposes of oral composition and the like. As to "dictation," it is a useful examination test, not a method of teaching spelling. Its use in the past has been excessive.

IV.

WRITING.

THE elaborate accounts of writing methods found in the old-fashioned school management books will not be reproduced here. Writing has, in years past, claimed a disproportionate share of time in the upper standards of the elementary school. It is essentially an art that should be taught, once for all, before the age of ten, and the teacher's efforts subsequent to that date should be devoted to maintaining the ground thus won. It seems absurd and ignominious that we should be "teaching writing" to boys and girls about to leave school; we might almost as well be "teaching walking" or "teaching tables."

In the infants' school, writing is frequently taught, as it should be, in close connection with reading,* more particularly when the Dale method is employed. There is no harm even in "babies" drawing letters in sand or on the millboard, though there are no strong arguments in favour of the plan. It may be preceded by air-tracing, a useful art also in later stages of writing and drawing.

In the lower standards, the great thing is to insist on correct position of hand and body in the writing lesson. Subsequent trouble springs mainly from lack of attention to this point. The wrist should be kept flat, the elbow reasonably close to the body, the body upright, the eyes at a good and an equal distance from the paper.

In the upper standards, there need be no insistence upon all children retaining the same style; but there should be insistence upon reasonable clearness and beauty of penmanship, not in special writing lessons, but in all the writing work of the pupils.† A system is bad which allows a boy to be marked "excellent" for writing a special exercise, if the same boy's "science notes" or "history notes" are as slovenly as they can be.

The excellence of a boy's writing must be judged from his ordinary style; just as the excellence of his behaviour or of his speech must be so judged. Time tables are useful and necessary, but they are dangerous the moment they suggest that "writing" need only be considered in the "writing lesson." This remark, however, only applies to the upper standards; we cannot expect little children to be judged in the same way; they are but learning the art, and they must, to some extent, learn it in isolation from other subjects.

* Impression—expression.

† It is perhaps worthy of mention that the increased growth of the child about the time when he enters "Standard V." may have something to do with the falling off in writing and drawing power alleged to occur about that time. See diagram on page 224 (Barnes's Plateau). Power of execution falls below power of criticism.

If the teacher, however, feels that, even in the upper standards, there should be opportunity for a little fancy writing, the best plan is to provide each child with an exercise book—with a special cover, perhaps, or with a cover that the pupil may design for himself—and allow him to enter in this book any passages, quotations, poems, facts, drawings, etc., of special interest, and to enter them *in his best possible style.* Such a writing book will stand in useful correlation with the rest of the school subjects, and may become an object of pride and affection, and one that the child may retain to the end of his life.

V.

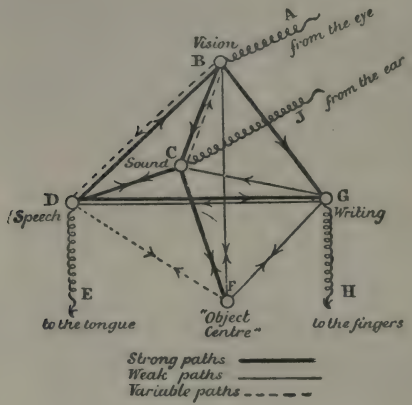
THE PHYSIOLOGY OF READING AND WRITING.

Discoveries, real or fictitious, are being made, almost every year, in the realm of brain physiology, and doubtless in the course of time valuable guidance will come to the teacher from this source. More particularly, our methods of teaching reading, writing and spelling will feel this influence.

Pages might be devoted to a discussion of the famous pathological "cases" which are supposed to have thrown light upon the mechanism underlying these arts. But the discussion would be a difficult one, and so surrounded by an atmosphere of controversy and uncertainty that the young reader would feel bewilderment rather than illumination. Still, I must try to indicate in outline some of the results dimly and dubiously foreshadowed by brain research. I shall state them dogmatically, and shall make hardly any attempt to work them into the main body of my remarks.

In the cortex, or grey matter, of the brain, there seem to be definite "centres" for different sets of ideas. Of these "centres" four, and possibly five, are of importance in this connection; the visual centre (for visual images), the auditory centre (for sounds or auditory images), the writing centre (for

motor images involved in finger movements), the speech centre (for motor images involved in articulatory movements of tongue, lips, etc.), and probably a "concept centre" or "object centre." Their mutual relationship is shown in the following diagram.



The "strong paths" in the above diagram are those along which the chief nervous impulses seem to run in normal people. But suppose a brain path were blocked by disease, one of the "weak" or "variable paths" might gradually come into use, and mental life be efficiently resumed. Where double lines occur, one of them is shown darker than the other, and the arrows point in opposite directions; thus a strong impulse may travel in one direction, but a weak or variable one in the other. Scientific students may be informed that the "speech" centre is the famous one discovered by Broca, and the "sound" centre, the almost equally famous one discovered by Wernicke; the "speech" and "writing" centres are both located in the great "motor zone" of the cortex, for speech and writing are both forms of motor activity.

"Reading aloud" will take place along the path ABCDE as a rule—the sight of a printed word calls up the image of its sound, and this calls up the image of its speech sensations (motor ideas of tongue movements, etc.), which then release the speech mechanism. The importance of the "sound" centre is the best established fact in this department of brain physiology, and is indicated in the diagram by that centre being placed between all the others. "Speech goes on from auditory cues."

"Spontaneous speech" will be along the path FCDE, starting from the "object centre" or the "concept centre" as it is also called.

"Copying words" will take place along the path ABGH, or along the path ABDGH. The student should translate this formula into the corresponding psychological language.

"Writing from dictation" will take place along the path JCDGH, or along the path JCDBGH, other paths possibly helping. The lesson for teachers is that correct spelling from dictation needs *correct "visual ideas" and correct "speech ideas,"* both of which (as shown by the heavy lines BG and DG) have a strong tendency to reproduce "writing" ideas.

And that is all that I propose to say on the subject, for it is about all that is known with any degree of probability. The lesson for the teacher is, Give the child the chance to use any brain path that may be most efficient in his particular case. Let him spell aloud, let him pronounce distinctly, let him see words, let him hear words, let him write words—*let all the centres and paths be employed.* It is probably bad psychology to teach by ear alone, or eye alone, or fingers alone; bad psychology, therefore, to tell a child "not to move his lips" in spelling words. I say, "probably," because the evidence seems to point that way; but the whole subject is still obscure. The one fact to remember is, that there are several centres and several paths.

VI.

SPEECH AND COMPOSITION.

Great Improvement in this Subject.

Improvement in the teaching of "composition" is probably the most marked change in primary education during the last few years. Whereas, not very long ago, composition was taught to children for the first time when they reached Standard V., it is now generally taught in Standard I., and occasionally in infant school grades even below that. And whereas the staple theme in Standard V. was formerly a short story read to the class, to be then (as a rule little more than a mere memory exercise) reproduced by the children, now even in the lowest standards an attempt is made to ensure that the composition is an expression, to some extent, of the child's own knowledge and experience. Thus, the ideal of "self activity," though far from being attained in this subject, is at least approached much more nearly than in the past.

The present section will make no pretension to being an exhaustive treatment of the subject, but will consist mainly of such common-place suggestions as seem to be most useful and necessary for the primary school of to-day.

Correlate with Other Subjects.

The most pressing need seems to be the full and frank recognition of the principle of correlation. Composition is still too isolated a subject, thanks mainly to the over-done "time-table" methods forced upon schools by the necessities of governmental inspection in the past. I question whether more than one weekly "composition" lesson is necessary for the average school. We hear much about the employment of "incidental methods" in various subjects, but composition should certainly be largely taught "incidentally"—that is, in connection with almost every subject of the curriculum. We should entirely distrust a system which allows a boy a "very good" or "excellent" mark for composition, when the latter subject is

assessed through a special essay, but allows him to use gutter language in answering questions orally, or to write the most slipshod English in his history notes or his science answers. The plan is utterly wasteful—it involves the imposition of a great many unnecessary composition themes, while the themes of history, geography, science, scripture, and so forth, lie ready to hand, and when these very subjects would profit greatly by being chosen for composition purposes. The plan is more than wasteful—it is pernicious; it suggests that "good composition" is a fancy device, to be used on special occasions, but not to be worked into the fabric of daily life.

There is very much doubt whether the modern curriculum is "over-crowded" at all. Its chief fault is dislocation, and this fault is most glaring in the present instance.

No doubt, if we teach written composition in the lower standards, special and isolated lessons will be necessary. These should generally take a collective form. The teacher should elicit a sentence from each scholar bearing upon some familiar subject; this sentence should be criticised, shaped, and finally written on the blackboard. Others would follow, and when at last the board is full, the class may perhaps copy the whole into their books. Or sometimes the teacher may ask the class to put a certain word into a sentence, the word "done," for example, or other words commonly misused. Similarly, too, a specific blackboard lesson in composition is useful even in the highest classes the teacher perhaps employing for purposes of criticism either the errors collected during the past few days or weeks from the exercise books of the pupils, or a series of badly constructed sentences chosen from the usual printed collections. Special themes and exercises will also be set, as I shall presently show.

But, generally speaking, the teaching of composition should go along with the teaching of other subjects. Thought and the expression of thought should not be permanently divorced

as hitherto they have too often been. It matters little if chaos is thus occasionally introduced into the lesson on history, geography, science, or arithmetic, the teacher departing from the "subject" to consider its expression in words. Almost anything is preferable to the superstition that we need only use "good composition" when the lesson is called by that name.*

"Such an 'incidental' method will take time from the other subjects," the teacher will object. "Instead of teaching history I shall be wandering away into discussions of composition." Certainly this will sometimes be the case, and in the first year or two after the introduction of this stress on the incidental method, it will take place quite frequently. But the teacher must remember that, under the scheme proposed, far more time will be assigned than in the past to history, geography, and other nutritive subjects, and that more time will thus be available for the overflow here recommended. Under present conditions, only one lesson a week can, as a rule, be devoted to history; hence the teacher feels obliged to confine himself rigidly to that subject. But if there were four lessons a week, he could adopt much more educational methods. Moreover, once the standard of practical "English" has been enormously raised—a thing quite possible by a resolute effort extending over two or three years—pupils will get used to their new circumstances, and the need for constant overflow from history, etc., to composition will become less and less.

I urge, then, as the most pressing need of our schools in this matter, that a fairly good and appropriate style of composition be insisted upon in connection with all subjects, arithmetic, science, history, geography, and the rest. Styles may differ; condensation and precision may be cultivated in arithmetic and science, copiousness and vividness in history

* In the *Suggestions* of the Board of Education (p. 30), a divorce between "descriptive lessons" and "observation lessons" is approved. This seems doubtful advice, though I do not press the point. An occasional divorce is no doubt inevitable.

and geography; but we have no right whatever to accept really bad English in any single subject.

As bearing on this theme, may be mentioned the somewhat undesirable practice, often adopted at terminal examinations, of setting "list" questions, or questions that can be answered in single words, "Henry VIII.," "Wolsey," "Gibraltar," and so on. The reason for the adoption of this plan is not far to seek. A certain amount of work has been prescribed, and the head teacher thinks there is need for the whole of it to be touched upon and tested at the examination; hence the employment of these encyclopædic questions. But I doubt whether, except within certain limits, such a plan is good even for the history (or other subject) being tested; and it is decidedly bad from the standpoint of composition. It is bad for the history, etc., as it conduces to the cramming of mere names; it is bad for composition, as it lets opportunities for this go by unused. *One or two* questions of a "list" kind may well be employed in examination, but I doubt whether more than this is desirable. There should be one or two of a "narrative" or "descriptive" type, and certainly two others involving *real thought*.

Oral Composition.

In the lower standards, composition, as is now admitted, should be mainly oral. Children should be encouraged to talk freely about the various subjects of their lessons; and, though there is no great harm in asking a child to "give a sentence" about a daisy, etc., a more desirable plan is to encourage him to "tell something he knows" about it, or "tell the class what he has just read." The "giving a sentence" plan has a suspicion of that formalism which is creeping into the early teaching of composition, and is manifest in the rather overdone insistence on never receiving a single-word answer. "What is this in my hand?" "A duster." "No, you must always say, 'It is a duster.'"

There should be no hard and fast line between "nature

study" or "observation" lessons and those on language until perhaps Standard III. is reached, when a specific blackboard lesson on composition, following the lines described above, is advisable. Oral narrative and description should be constantly encouraged.

Answering Questions.

Perhaps the most important thing of all is care for the children's oral answers to questions. "There ain't no rivers there," "Julius Cæsar come over to England," "The battle what was fought at Hastings," and the like, are answers constantly forthcoming from elementary pupils, and the teacher lets them pass, on the ground that the lesson is "not composition." Could anything be more absurd, and, except in the light of the history of time tables, more inexcusable? Sometimes, conscious of the situation, the teacher says, quite correctly, "You ought to have said so-and-so"; but even he will rarely make the child *repeat* the grammatical answer—still less, repeat it several times. "When a boy is told a thing he goes and does it." Excellent Mr. Squeers! In this way we can "teach English"—and teach it well.

In upper classes, considerable attention should be given to matters of margin; indenting for new paragraphs and for poetical quotations; the correct use of parentheses (they are almost universally used *incorrectly* in schools as signs of erasure); the free use of capitals in headings, names of railways, etc.; the use of double and single quotation marks; modes of address in letter writing to various types of people; the subtle distinctions between "yours sincerely," "yours truly," etc.; abbreviations of names and titles ("Henry VIII." is often written "Henry the VIII.," "Henry VIIIth.," etc.), and all such matters as crop up in the course of the work. Again, the legitimacy of a stiff style in a business report, and its entire illegitimacy in a letter to a friend may be pointed out. Composition is a mode of expression, and should vary with circumstances. A few specific lessons on these subjects seem desirable, in addition to incidental teaching.

But no number of specific lessons are sufficient to make children compose well. There must be a wealth of ideas, linked to wealth of words, and this is scarcely possible, except through copious reading. Once again, impression must precede expression. It is one thing "to have to say something" and another thing "to have something to say." The latter is the most usual difficulty experienced by our pupils, and it is usually got over by the teacher supplying an outline and series of suggestions. There is no grave objection to this, so long as it is not the only method adopted. Another method is to use the class subjects (history, etc.) for composition purposes. But sometimes, if not frequently, it is desirable to encourage a more independent kind of composition than either of the above. One useful suggestion is that of Mr. Hartog; the teacher gives the bare outline of a story, and the pupil is expected to fill in the living details from his own imagination. Another useful exercise is the reverse of this, namely, the condensation of a lengthy narrative into a short one. In freehand drawing the "copy" may be either enlarged or reduced. Again, sundry hypothetical cases in history or other subjects may be proposed (*e.g.*, "Suppose Napoleon had been victorious at Waterloo"), and the pupil has to write upon these imaginary themes; or, again, dialogues between historical personages may be composed.

One of the teacher's chief difficulties is the time involved in "marking." This can be largely got over by a system of signs, one letter (say A) standing for "bad spelling," another (say B) for bad grammar, a third for incorrect information, and so on.

Against one common "idol of the market-place" I emphasise the protest already raised by Mr. H. G. Wells.

Always Simple Words?

"Always use short sentences, and always use simple words," our children are being daily told in most of our English schools. Insistence on short (written or oral) sentences in the lower standards, and cautious criticism of adolescent bombast in the upper,

are justifiable; but that a deliberate attempt should be made to deprive our language of all form and richness, and that this should be done in the name of education and progress is one of the most incongruous things of the present day. Short sentences and simple language may be good; long sentences and rich language may also be good. On the whole, I would back the boy who is capable of the latter against the boy who is not. Everything, however, depends on circumstances. Only let the teacher of the adolescent boy or girl—approaching the top of the "slang curve"*—hesitate before mercilessly criticising the ponderous wit or the lurid language of his pupil. Higher marks should be given for a bold essay with mistakes than for one that is common-place, though neat and correct.

Much composition will ultimately be taught in connection with our schemes of literature. Some wonderfully apt metaphor is employed by a great writer; some new word occurs in the midst of a passage in the reformed reading book; the pupils are thereupon directed to compose a similar metaphor (they will probably fail), or to use the old metaphor or the new word in a different connection. There will be much *incidental paraphrasing*, too (just as there will be much incidental grammar). Here is an impressive or a difficult passage; a boy is called upon *there and then* to paraphrase it. How far better than to have a special time for paraphrasing, and special themes, quite isolated from the other studies of the pupil! Paraphrasing, analysing, even parsing—these things are all useful in their way, but they should be kept close to the reading lesson or the lesson on literature.

In a previous chapter I have pointed out that the class

* "Slang" reaches its maximum about the age of fourteen. It is merely a symptom of exuberance—desire for fuller self-expression than ordinary language affords. Occasionally it culminates in the frequent use of "damn" with boys and of "awfully" with girls. Elderly people are shocked, but the expressions mean nothing at all, though they may involve the acquirement of a silly habit.

should be encouraged to learn passages from literature—especially the famous "quotations" that are on the lips of all educated men—and to embody these in their composition exercises. The advice is quite open to criticism, and I can conceive of it being carried out in a mechanical, undeviating manner, largely destructive of genuine self-activity. But if the literature (and other) lessons are genuinely stimulating, and if, in addition to them, there is copious private reading on the part of the pupils, quotations and other embellishments to the composition will be forthcoming in abundance—perhaps even in excess. The use of common French and Latin phrases may also be encouraged within limits determined by circumstances. Finally, I would add that the moral purpose of composition should be always made clear—the setting up of humane, just, and happy relations with other people.

(F. H. H.)

CHAPTER XV.

The Language Arts (*Continued*).

VII.

ELOCUTION OR RECITATION.*

ALL speech should be one long song, not sing-song, the difference between speech and song being that in song the singer keeps to a tune generally set by another—the composer; while in speech, elocution, or recitation the reciter is himself the composer of the tune. Here the reciter has an advantage over the singer. The singer is restricted, at least under our modes and scales, to intervals of a semitone and its additions, while the reciter may proceed by any smaller grade of difference of pitch that the voice is capable of producing.

Relation of Speech and Song.

The human voice is the most perfect of musical instruments in this respect. There is no other instrument which can proceed from one extreme of pitch to another in a single slur or inflection, absolutely without a break, a perfect *legato* or *portamento*. In doing this it can stop at any particular number of vibrations required, and proceed by units of vibration from pitch to pitch. How do our man-made instruments compare with this? The Hindu instruments divide some of the tones of our diatonic scale into three and four intervals. Western tempered instruments divide the octave into only twelve equal semitones, though on others, it is true, a greater delicacy is attained.

The Human Voice as a Musical Instrument.

* Some aspects of elocution, or recitation, have already been considered (pp. 68-80).

A defective and rudimentary scale may be taken as a sign of a degenerate race of people. Many of the ancient races have preserved a merely pentatonic scale—that to be found by playing the black notes only on the modern Western keyboard. The Erse, the Gaelic, and Chinese are examples of this. The fact is that all musical systems are attempts or approximations towards reducing to science or order what is found in nature either in the human voice or in some other element in the realm of sound. Musical systems then are useful analyses of the constituents of speech. But they are not exhaustive analyses.

The Reciter as Composer.

Recitation must still be studied *qua* recitation, and in considering its elements the analysis may have to be pushed further than in music. It is a curious fact, worth noting here, that modern music-hall singers have almost abandoned the practice of following a set tune. There may be many reasons for this. The scoffer may say that it is because they are not musically capable, or that they are in some other respect incapable. But the fact itself remains, and it is worth while to find some other reason. It is suggested that the liberty of composing their own tune suits much better the dramatic purpose they have in view, and helps in making a more vivid and realistic impression. Thus the art of recitation is not trammelled like that of song by being limited to at most twelve semitones to the octave, five of which are generally omitted (the diatonic scale), but is free to employ any number of changes of pitch.

Whole Compass of Voice to be Exercised.

The first point, then, in good recitation is that the voice should be *used over its whole gamut* from the highest sounds to the lowest (not necessarily, however, in every example), and that pieces should be chosen that will give this opportunity. There are few single examples that will afford such use, and hence short selections should be used as exercises

chosen for this particular purpose. When more than one voice is represented in a selected piece a sound attempt should be made to distinguish them, and this will exercise more than one region of the reciter's voice. It is most difficult to disguise the speaker's natural voice, and a study that demands concentrated attention; but when well done nothing has more effect on an audience, and the scholars who attempt and those who hear will be greatly interested in the effort. Most actors and actresses fail in this respect. It is easy to produce the "hands of Esau," but the voice is still the "voice of Jacob."

Disguised Voice.

There are many recitations suitable for school use where an adult's voice and a child's voice have to be imitated. This can be easily done by speaking all the child's words in a high tone and the adult's in a low pitched voice. The same is the case with a man's voice and a woman's. This use, of course, corresponds with the natural fact of a child's voice and a woman's being one octave higher than a man's. But it is a point often missed by teachers.

The next point about good recitation is that, generally speaking, the better it is the slower it is. This is a commercial age when "time is money." Well, just as this saying represents a degenerate spirit, so our ordinary talk is degenerate speech, and the tendency to employ it should be firmly resisted. There are elementary schools where it is a genuinely Herculean task to attempt to insist on "nothing" for "nuffink," "better" for "be'er," and "y-es" for "y-us." Indeed, in the ordinary vocabulary of the school it is at present almost impossible, in the reading it is just possible; but in the recitation lesson a model should be set by the teacher and inexorably insisted on. Thus the recitation lesson should be the time for introducing that "leaven which leaveneth the whole mass." The reading will become infected, and later the ordinary conversation.

Many elementary school teachers now teaching in the London schools were reared in an atmosphere of overwhelming cockneyism. But as the result of persevering effort, their speech would now adorn any stage. It is also noticed that provincial teachers with very "pronounced" features in their pronunciation do, with a little careful study of the elements of elocution, soon arrive at the approximate standard accepted in all educated circles. Many of the faults in bad recitation disappear after insistence on a slower rate of delivery. Just as a good singer will nearly always sing a song more slowly than a bad singer, so a good reciter will speak more slowly than a bad one. Why? Because the good singer and the good reciter have more to put into the song or story. The bad singer or reciter leaves out so much that there is little left to dwell on. Hence the skurry to get to the end. (It is a compensation to the audience.)

Teacher as Model.

The good reciter employs a wide range of pitch on each vowel sound, and each inflection of the voice takes time to execute. The bad reciter keeps nearly to a monotone. Any vowel sound may necessitate a double inflection for its proper expression. The voice may have to rise and fall, or fall and rise. The bad reciter knows so little what to do that he is almost afraid to breathe. What he does attempt is so little worth hearing (and he generally knows it) that he tries to crowd a lot into a short space of time with the idea of giving one full value for one's money. The good reciter is confident that each breathful is making its impression, and that the next breathful will be worth waiting for. Hence the absence of physical distress, which distress is entirely due to disorderly breathing.

Knowledge is Power.

The use of a small range of pitch is destructive to the quality of the speaker's voice and to the auditory and artistic sense of the hearers. It is a case of a callous voice and

callous hearers. Many cases of laryngitis are directly attributable to this misuse of voice. Certain muscles used in shortening or lengthening the vocal "chink" become hypertrophied from over-work, while others are atrophied from want of work. In this case the art of singing will help the reciter. An average untrained voice ranges about an octave. The average trained voice easily ranges over two usable octaves. Here, then, the singer has double the range of the ordinary speaker. This is a great start for the singer, and a great handicap for the ordinary student of recitation. A good reciter may range over the whole of the tones in the two octaves during the expression of a single vowel sound, and, moreover, may range over them more than once.

In addition to the necessity of using the whole gamut of the voice is the need of method in moving from one pitch to another. On this depends the smoothness, and absence of jerkiness, in the performance. It is as important as curves in a beautiful landscape, or in a painting. It is a succession of curves in sound. Singers call it 'carrying the voice," also the "slur" or "glide." The Italian term is *portamento*. It is generally understood to be taboo. This is because it is generally done badly. There is nothing bad in Art any more than in Nature. Everything is good. "Dirt" is only "matter in the wrong place." Elocutionists call this moving from pitch to pitch, inflection.

Portamento Correct.

In singing in any other method than *staccato*, the voice must be carried by a glide from one tone to another. This is the unique and characteristic feature of the voice as a musical instrument, and must be faithfully preserved. No other instrument can produce this connecting link habitually. Out of the whole of the modern full orchestra only the bowed string instruments can do it occasionally, or exceptionally. Habitually, it is impossible. Trombones might do so occasionally, but, happily for the hearers, they do not attempt it.

This unique feature of voice is worthy of very careful attention. It is wrongly employed when it is made any more use of than as a link in a chain of resting-places. It must almost always be subordinated to the point of pitch attained by its use. In a word, it must almost always be performed quietly, both in singing and recitation; a thing easy to state—difficult to perform. It is best attained by singing a note moderately loudly, sustaining a short time, then dropping quietly down an octave, and resting at the note gained, with a firm, even tone. Then wider intervals, up to two octaves, may be practised. These compound intervals are rarely used in vocal music, but must be practised specially for recitation. The falling inflection is most easily acquired. The rising should be taken in the same way. Next take the double, falling and rising; then rising and falling. Vowel sounds may be first used, afterwards selected words.

Exercise for Inflection.

It is rather by exercises to the point, or to some point, that progress will be made than by years of "Say-your-poetry" method, or want of method. The teacher should pattern words to be imitated by the scholars in the exact tone of voice. A skilful teacher can get astonishing results in this way. A whole class will recite a long piece with absolute uniform tone. This is not altogether desirable. Rather should each scholar be encouraged to give an individual rendering of some piece, not necessarily a piece chosen by the teacher for the class. In many of the elementary schools will be found scholars who can recite in French, German, Italian, or Bohemian. This is excellent training for the ear of the scholars, who are accustomed to hearing the sounds of one language only. He is a dull rascal indeed who will not prick up both ears at a recitation from one of his school mates in a foreign language. It may be only the interest of curiosity, but it takes a deal of satiation. Do not let us

Interest in the Art of the Subject.

snuff out anything from the schoolroom that will rouse interest, unless it be positively harmful. Want of interest seems to be the great trouble in modern elementary school life, and it is easy to find dangerous pitfalls in the endeavour to circumvent this lack. For the upper standards, a Shakespeare or other classical play is excellent training in the art of using and changing the voice, especially if characters are allotted. The best reciters should be chosen, and the characters changed when the reciters selected have become quite familiar with one part.

Volume of Voice Desirable.

Apart from the range of voice and the method of ranging are the quality and amount of voice at command. The amount can be increased almost indefinitely. The walls of Jericho fell to a shout and the sound of trumpets. Modern Russian basses (it is stated) are tested for volume of voice in a glass-partitioned room; they have to sing and break the glass (with their voice). The quality of voice produced will be right if the vowel sounds are pure, that is, if there is no interference with them from the partially closed mouth, or from any other cause. The quantity of voice will be increased by proper practice. No amount of head voice "kooing" (or is it "coo-ing?"), will produce a roaring lion. The art of recitation, as also of life, requires the roaring lion as often as the cooing dove.

Strength of voice will not be developed unless the opportunity for exercising strong voice be given. The school halls are excellent places for this kind of practice. It is not suggested that simultaneous practice for developing strength of voice should be given. The school walls are not likely to follow the lead of the walls of Jericho, not being "jerry-built," but a little of this kind of thing goes a long way, and there are neighbouring classes in the school, and neighbouring and labouring masses beyond, to be considered. Individuals, however, should be encouraged to exercise the extreme ranges of

expression, from very soft to very loud, and from very slow to very fast.

Strength of voice does not mean shouting. Shouting generally puts undue strain on the vocal organs and on those only. Strength of voice depends on enlarging the cavity of the mouth, increasing the capacity of the lungs and developing all the resonant powers. First catch your hare, then cook it. First get your voice, then play on it. Play all over it. Play properly from one part to another. This makes the tune.

Importance of Rhythm.

Another large element in singing is rhythm. So in recitation. Here again singing is limited: Two in a measure, three in a measure, four in a measure, all through the piece; rests. Modern musicians are advancing: One measure of four accents —the next of five. A whole movement in five-four time. Reciters have still more liberty. All poetry obeys some law of rhythm if not of rhyme. Rhyme may be missing, but rhythm never. A good deal of licence is allowed in rhyme, but not in rhythm. Alliteration may go, rhyme may go, but rhythm goes on for ever. A good deal of licence is allowed the reciter as to how he voices the rhythm.

The rhythmic plan must not be emphasised to the point of monotony. Rhythm should be clearly heard and then almost lost sight of, or artfully hidden, almost (*but never quite*) to the point of losing it. Then again it is brought out prominently. Contrast is the great effort to be aimed at with regard to rhythm. Most of our great poets owe their reputation largely, perhaps more largely than many think, to their great command of differing rhythms. It is, perhaps, not going beyond the fact to say that the reputation of the poetry depends almost as largely on the wealth of rhythmic invention as on the substantial value of the ideas expressed. Many of our hymn-writers are sad sinners in this respect, it being next to impossible to set their words to any kind of music, and some of their accented words when sung are nothing less

than atrocious. Mark the difference when the hymn-writer is a poet as well—Cowper for instance,

Children have a great delight in making discoveries, and when they find out the rhythm of their piece they are likely to let the hearer know it. The monotonous effect of this can generally be brought home to them by the teacher "out-Heroding Herod," and imitating their delivery, "only more so." They will soon see the absurdity of it and avoid it. How to avoid it must be taught. Rhythm is produced by emphasis or accent occurring on a certain count throughout the piece. This should be carefully noted and then avoided. But how? In this way. Besides the scansion of the words demanding certain accents, the sense of the words demands the same. Certain words are important; others are less so. Nouns and verbs are generally the important words, while conjunctions, prepositions, adverbs and other parts of speech are not so important. If the important words always correspond with the strong accent required by the scansion the monotony of the rhythm would be very difficult to avoid. But this is where the poet, either born or made, comes in. These accents when properly read just alternate enough to give great beauty of contrast. The pupils must not be allowed to mark the accent demanded by the scansion unless it be also demanded by the sense of the word measured by its importance.

Great Conceptions demand Grand Forms.

The pupils should be allowed to see clearly the rhythm of the piece even to the point of reading it apart from the proper sense—that is, "scanning" it. The upper classes should know the names of the chief rhythms employed—iambic, trochaic, dactylic, anapestic, etc.—and the derivations of the terms. Dactylic=like a finger, one long joint and two short ones:—

Classification of Rhythms.

— ‥ — ‥ — ‥ — ‥

Merrily, merrily shall I live now

— ‥ — ‥ — ‥ — ‥

Under the blossom that hangs on the bough.

Anapestic is the reverse of this, two short and one long. Any good English text-book treats these matters under the head of Prosody. The force of voice to be employed depends on the emotion to be expressed.

Read and re-read Hamlet's advice to the players, Act. III., Scene ii. :

"But if you mouth it . . . . I had as lief the town-crier spoke my lines."

"Nor do not saw the air too much with your hand, thus."

"Use all gently . . . . you must acquire and beget a temperance."

"It offends me to the soul to hear a robustious periwig-pated fellow tear a passion to tatters."

"Let your own discretion be your tutor . . . . o'erstep not the modesty of nature."

"Anything so overdone is from the purpose of playing."

"Now this overdone or come tardy off . . . . cannot but make the judicious grieve."

"O, there be players . . . . have so strutted and bellowed that I have thought some of nature's journeymen had made men and not made them well."

It is not the absolute force of voice employed that is effective, but the range of force employed, from quiet to loud.

"The Lord was not in the earthquake or the fire, but in the still small voice" (I. Kings xix. 12).

Changes of speed should be practised. Like everything else in art or action, you have only to increase the speed indefinitely to make performance impossible. But a change of speed is one of the effective means of expression, and it must be achieved. Enunciation is much more difficult done quickly. Such pieces as "Peter Piper," have their use.

Voice only has been hitherto considered as the organ of recitation. But there are whole series of pantomimic plays where not a word is spoken. Gesture must not be left out of account. Rather make it a species of drill than leave it out.

Gesture.

Indeed, it is time that drill movements took on more of an intellectual and less of a military or at best mechanical form. A system of drill based on suitable movements for the scientific expression of the emotions would be a boon.

Again take Hamlet for a guide:

"Suit the action to the word, the word to the action."

Encourage the scholars to make their own suitable gestures. Not many scholars will do this on their own initiative; it is not the fashion. But once commence, and it is surprising how it catches on. The movements to be noted are the walk, gestures with hand, arm, and face, and the attitude or poise of the whole body. Every teacher should possess a good book on the technique of elocution.

VIII.

PHONETICS.

THE study of Phonetics includes an examination (1) of the sounds used in language, (2) of the organs of speech used in producing these sounds, and (3) of the signs used to identify the sounds. In an ideal phonetic system the alphabet of a language ought to be a table of signs, where each sign represents only one sound, and each sound required in the language is identified with one sign only. The accumulated wisdom of the ages has ordained that in English this shall not be so, and hence arise many difficulties of reading and spelling. Beginning with the vowels, these are:—

SIX LONG.

I.	II.	III.	IV.	V.	VI.
P*a*'s	c*ur*	sh*e*	th*ough*t	s*o*	p*oor*.

SIX SHORT.

VII.	VIII.	IX.	X.	XI.	XII.
Th*a*t	p*e*n	*i*s	n*o*t	m*u*ch	g*oo*d.

FIVE DOUBLE VOWELS, OR DIPHTHONGS.

VII.+XII. I.+IX. IV.+IX. VIII.+IX. IX.+VI.

(1) N*ow* (2) m*y* (3) bo*y* (4) pl*ay* (5) t*unes*.

To represent these sounds there are only five signs, *a*, *e*, *i*, *o*, *u*, or seven, including *w* and *y*, and these have to do duty for the above seventeen sounds.

The following is a table of typical words:—

I.

F*a*ther.	*A*h.	L*a*unch.	Clerk.	H*ea*rt.
G*ua*rd.				

II.

H*er*.	*Ear*n.	S*ir*.	Work.	Colonel.
J*our*ney.	F*ur*.	G*uer*don.	M*yr*rh.	

III.

*Ee*l.	*Ea*sy.	C*ei*ling.	P*eo*ple.	K*ey*.
Mach*i*ne.	Gr*ie*ve.	C*æ*sar.	Q*ua*y.	

IV.

*A*ll.	*Au*ght.	P*aw*.	A*we*.	*Or*.
Br*oa*d.	*Ou*ght.			

V.

G*o*.	H*au*tboy.	B*eau*.	Y*eo*man.	S*ew*.
*Oa*k.	T*oe*.	Brooch.	S*ou*l.	Bl*ow*.
*Ow*e.	Th*ough*.			

VI.

D*o*.	Sh*oe*.	Manœ*uvre*.	*Oo*ze.	S*ou*p.
Thr*ough*.	Rh*eu*m.	Br*ew*.	R*u*ler.	Tr*ue*.
Fr*ui*t.	T*wo*.			

VII.

*A*t.	Pl*ai*t.

VIII.

*A*ny.	S*ai*d.	S*ay*s.	*E*nd.	Br*ea*d.
H*ei*fer.	L*eo*pard.	Fr*ie*nd.	B*u*ry.	G*ue*ss.

Pr*ay*er (not pray-er=one who prays).

IX.

*I*t.	Marr*ia*ge.	S*ie*ve.	Br*ee*ches.	Forf*ei*t.
Women.	B*u*sy.	Bisc*ui*t,	H*y*mn.	

X.

Dog.	C*ou*gh.	Kn*ow*ledge.	W*a*sh.	L*au*rel.

XI.

*U*p.	D*o*th.	D*oe*s (to do).	Bl*oo*d.	T*ou*gh.

XII.

P*u*ll.	Woman.	F*oo*t.	C*ou*ld.	

DIPHTHONG 1.

Th*ou*.	B*ough*.	Br*ow*.		

DIPHTHONG 2.

K*i*nd.	D*ie*.	H*igh*.	*Ai*sle.	*Aye* (=yes).
H*ei*ght.	*Eye*.	Ch*oi*r.	G*ui*de.	B*uy*.
B*y*.	D*ye*.	*Ey*rie.		

DIPHTHONG 3.

*Oi*l.	B*oy*.			

DIPHTHONG 4.

*A*le.	*Aid*.	G*ao*l.	G*au*ge.	S*ay*.
Aye	Th*ey*.	Br*ea*k.	V*ei*l.	W*eigh*.

DIPHTHONG 5.

*U*sual.	B*eau*ty.	F*eu*d.	D*ew*.	*Ewe*.
Adi*eu*.	V*iew*.	D*ue*.	S*ui*t.	S*iou*x.

The consonants are the forms for commencing, ending, or separating the vowels. Twenty-four are simple, including *w*, *h*, and *y*. The following are a complete list used finally and initially:—

(1) Ro*p*e, *p*ost.	(2) Ro*b*e, *b*oast.	(3) Fa*t*e, *t*ip.
(4) Fa*d*e, *d*ip.	(5) E*tch*, *ch*est.	(6) E*dge*, *j*est.
(7) Lee*k*, *c*ane.	(8) Lea*gue*, *g*ame.	(9) Sa*f*e, *f*at.
(10) Sa*v*e, *v*amp.	(11) Wrea*th*, *th*igh.	(12) Wrea*th*e, *th*ine.
(13) Hi*ss*, *s*eal.	(14) Hi*s*, *s*eal.	(15) Wi*sh*, *sh*e.
(16) Vi*sion*.	(17) See*m*, *m*et.	(18) See*n*, *n*et.
(19) Lo*ng*.	(20) Fa*ll*, *l*ight.	(21) Fo*r*, *r*ight
(22) *W*et.	(23) *Y*et.	(24) *H*igh.

From this table it will be seen that there is both redundancy and deficiency: *c* in censer, *s* in sense, and *sc* in scent, are three signs for one sound. *Th* in thigh and in thy has double use. *X* is a compound consonant with three sounds as shown in exercise (=ek-sercise), exist(=eg-sist), and anxious (=ang-shous). *Ch* and *j* are also compounds: *ch*=t-sh (church=t-sh-ur-t-sh); *j*=d-zh (jam=d-zh-am). The final sound in hush has two signs, *sh* and *ti* (action=ak-shun). Initial *w* is really Sound XII. (note the name, double u), initial *y* is really Sound IX.; but these are often regarded as initial consonants. *Wh*=*hw* (what=h-oo-t).

Combinations of Consonant Forms.

The following table of typical words illustrates these:

P.

*H*elp. D*a*mp. C*a*rp. Lis*p*. *S*peak. *Pl*ain. Peop*l*e.
*O*pen. *Pr*ay. Gra*p*es. Leap*t*. Dip*p*ed. De*p*th.

B.

Bu*lb*. Rho*mb*. *O*rb. We*bb*ed. *Bl*ame. A*bl*e.
Ba*b*es. *Br*ead.

T.

Ra*ft*. A*ct*. Ma*lt*. Drea*mt*. Te*nt*.
We*pt*. A*rt*. Fa*st*. *St*ay. Pu*sh*ed.
Li*tt*le. Ki*tt*en. *Tr*y. Po*ts*. *Tw*ine.

D.

Di*gg*ed. Wi*ld*. See*m*ed. Bo*nd*. Ba*ng*ed.
La*rd*. Ba*th*ed. Lo*v*ed. Bu*zz*ed. Do*dg*ed.
La*dl*e. Ga*rd*en. *Dr*op. Wi*dth*. *Dw*ell.
Goo*ds*. Sa*nds*. Be*ds*. A*nd*.

K.

Mi*lk*. I*nk*. A*rk*. *Sk*y.
Ba*c*on. *Cr*owd. A*sk*ed. Ba*k*ed.
Mi*x*ed (*kst*). Lu*x*ury (*ksh*). Junc*t*ion (*ngksh*). *Qu*een (*kw*).
Bi*cy*cle. Ca*k*es. Si*xth* (*ksth*).

G.

*Gl*ade. Bu*gl*e. *Gr*eat. Lan*gu*age (*gw*). E*gg*s.

F.

E*lf*. Wha*rf*. *Sph*ere. *Fl*y. Tri*fl*e.
O*ft*en (silent *t*). *Phr*ase. Cu*ffs*. Le*ft*.
Fi*fth*.

V.

Twel*v*e. Ca*rv*e. Shov*el*. Hea*v*en. Li*v*es.

S.

Fa*ls*e. Dan*c*e. Amon*gst*. Ver*s*e. Ghos*ts*.
Bir*ths*. Mon*ths*. *Sm*ooth. *Sn*ake, *Sw*im.
Ki*ngs*. *Sl*ave.

Z.

Ba*ths*. Ba*lls*. La*mbs*. Pa*nes*. So*ngs*.
Fi*res*. Puz*zl*e. Pri*sm*. Do*zen*.

L.

*Gi*rl. *Ch*lm. Sto*len*. We*alth*.

R.

A*rm*ed. *Sh*rank. *Cr*ab. W*arm*th. Swa*rm*s.
Ba*rn*. *Str*ength. *Thr*ee. Ma*rsh*. Wo*rth*.

H.

*Wh*irl.

W.

*Thw*art.

REDUPLICATED CONSONANTS.

Ship *p*ilot.	Rub *b*oots.	Quite *t*ight.
Good *d*ay.	Book-case.	Big *g*irl.
Chief *f*oe	Native *v*ales.	Dense *s*moke.
His *z*eal.	Warm*th* *th*aws.	With *th*ee.
Fres*h* *s*ugar.	Hu*g*e *g*iraffe.	Coc*k* crows.
Steel *l*ance.	Du*m*b *m*ouths.	Broke*n* *k*nees.
Poo*r* *r*hymes.	Lo*v*e *v*irtue.	

ALLIED CONSONANTS.

Wa*s*p *b*ites.	Ne*x*t *d*oor.	Edge*d* *t*ools.
Oa*k* *g*roves.	Nati*v*e *f*ields.	Pious *z*eal.
Sei*z*e *s*laves.	See*th* *th*ee.	Wrea*th*e *th*istles.
Stra*n*ge *sh*ows.		

Most of the actual mechanical difficulties of articulation and vocalisation are aggravated by hastiness. It is most astonishing that stammerers never carry their defects into song. The reason is that in song there is a properly measured interval of time for each sound, while in speech the sounds and articulations required are often smashed up together into a confused jumble. In children this tendency should be firmly checked. "If a thing is worth saying at all it is worth saying well" paraphrases a useful old saw. Surely in school work there is still left time to speak properly.

The same rule applies to the pronunciation of polysyllabic words. There is no difficulty in getting a child of two years of age to say distinctly such words as "regulator" if the syllables are properly separated and said slowly—reg-u-la-tor. If, however, the child is confronted with a long word the trouble generally arises through not recognising how many articulations or joints the word should have. These should be counted on the fingers while the child makes a stop after each syllable.

The section on singing must be consulted for the question of training the organs of speech. It is useless trying to practise consonants alone, for they have no sound. All

difficulties can be overcome by attaching them to a vowel, initially or finally, or both. Thus, taking *p* as an example, it can be attached to Vowel II., and repeated.

(1) pe(*r*), pe(*r*), pe(*r*), pe(*r*).

(2) e(*r*)p, e(*r*)p, e(*r*)p, e(*r*)p. Each of these should sound like e(*r*)pe(*r*).

(3) e(*r*)p, pe(*r*), e(*r*)p, pe(*r*).

Undoubtedly the initial consonants that give most trouble are the *th* in *th*ick and *th*is. Here the mechanical trick must be taught of placing the tongue against the teeth, and blowing through. This can be learnt apart from any verbal sound.

All the double consonants illustrated in the tables of typical words given above should be lengthened into syllables for practise. Thus *orb* should lengthen into or-e(*r*)b(*er*), and similarly with all the others. All these adjoined consonants were possibly once separated by vowels, which have disappeared. It will be well to preserve them to the ear. If they have gone out of sight, they need not go out of mind. Let us rescue our speech before it degenerates into the Hottentot grunts.

(E. A. T.)

IX.

ENGLISH GRAMMAR.

I was taught "grammar" at school, and was able to parse and analyse as vigorously as the best in the class. But the memory of those ultimate triumphs over "compound" and "complex" sentences has never obliterated the earlier memory of my introduction to grammatical mysteries.

I learnt that there were four "genders" in English (unique language!), though the fourth "gender" seemed under an unworthy cloud of suspicion, for, instead of parsing "horse" as "common gender" in an honest fashion, we were directed to allege that it was "common *as to* gender," whereupon

I marvelled for a moment (my "faculty of reason" stirring rebelliously), but soon acquiesced, on the ground that my teachers *must* be right. For years after this I regarded "gender" as a distinction of things, not of words. Consequently, when I began to study French, I felt that the French "genders" were the strangest things in the world (how on earth could inanimate things be "masculine" or "feminine," and how could the French get on without the "neuter" and "common" genders?). When I began to study Latin, I learnt the truth for the first time. Gender was a distinction of words, not of things; its connection with sex was often very indirect, and sometimes non-existent. In fact, English nouns, with very few exceptions, had no "gender" at all. "Boy" was not "masculine gender" and "girl" was not feminine; a boy was certainly a male and a girl a female, but that was a different statement altogether.

The "Science" of Language.

Again, I was given to understand that there existed another distinction in nouns—so subtle, it seemed, as to be quite non-existent in the nouns themselves, and only discoverable by an examination of their use in any particular case; this was "person." The noun "boy" is first, second, or third person, according to circumstances. Whereat again I marvelled a little. Why this much-ado-about-nothing? In the case of pronouns, the distinction was rational enough. Pronouns certainly possessed "person"; it seemed equally obvious that nouns did not. Was "person" a distinction between words or between usages of words? The former, apparently, in the case of pronouns; the latter, apparently, in the case of nouns. Grammar was verily a strange subject. Instead of "teaching me to think," it taught me to give up thinking in despair.

Then, too, I learnt that verbs agreed with their "subjects,' or "nominatives," in number and person. Faintly I saw the truth of this in the case of the verb "to be"; it was the

only important example that could be adduced. The vast mass of material which confronts the boy who knows Latin or French—material from which the above induction can be drawn—was unknown to me. I took the teacher's statement on trust. It must be right. What was true of the verb "to be," must be true of other verbs. They, too, must "agree (somehow) with their nominatives in number and person." The plain truth, of course, is that they do not. There is a special form for "third person singular present indicative"; and to this extent only a verb "agrees with its nominative." Broadly speaking, a verb does *not* "agree" with it at all. "Agreement," to be genuine, must be noticeable. To say that a man and wife "agree" when one of them is dead, or locked up, is an abuse of words. Similarly with the other almost wholly imaginary "agreements" of grammar, verb with subject, relative with antecedent.

But the greatest mystery of all was the "governing" of nouns "in the objective case." What was this mysterious "governing"? No one ever told me. Even the best of teachers could never have successfully explained it, apart from reference to the Latin tongue. There are, in fact, only seven words in the English language that illustrate the "governing" function of prepositions and transitive verbs, and one of these is obsolete—the words *me*, *thee*, *him*, *her*, *us*, *them*, and *whom*. There is not a noun among them. No English noun is "governed" in the objective case, for no such case exists in nouns. To assert the governing function when such a function is absent—to make children's parsing repeat for years this obviously false view of grammar—is not the way to "make children think." Prepositions, in Latin, "govern" the objective or some other case; English grammar is exactly different; the preposition has no governing influence whatever upon nouns. There is even a wicked, lawless, anarchical usage of nouns known as the adverbial objective ("I walked five hours"), in which the noun resolutely refuses to be "governed"

at all. One might say, too, with perfect truth, what I was taught to say only of the verb "to be," that transitive verbs "take the same noun case after them as before them." "This *boy* strikes that *boy*." Thus we have not only taught our children doubtful things; we have taught them what was false. If we had inserted the word "not" in some of our rules of grammar, we should then have been right. Even *verbs* had "objective cases," I learnt; "I love to go." And even sentences might be "governed in the objective case," as when we say, "I wish that he may be present on the occasion." That prepositions sometimes "govern" what looks like a possessive case, as in "This book of mine," "The very tyranny and rage of his," "The book of Mary's," I discovered years later; yet there was no joy in the triumph, and no one has ever thanked me for so momentous a discovery. I believe that on a basis of comparative grammar (French, etc.) "mine" and "his" in these sentences can be shown to be *not* possessive cases at all; but is that to be dealt with in an elementary class? *The game is hardly worth the candle.*

Many readers may think the above remarks unfair or superfluous. My main object in writing them is to emphasise, at any cost, the fact that, if we are to teach English grammar at all, we must throw overboard nine-tenths of our conventional distinctions, which, being derived from the study of Latin (a synthetic language), are impossible of transference to English. Our distinctions are utterly illogical, and sometimes, as I have shown, positively false. I do not blame anyone; we have all taught the same things as were taught us. But it is now time to recast entirely our teaching of grammar; to cut it down enormously, and to confine ourselves to what is both true and practical. As Professor Welton says, grammar should be "subordinate and incidental." I am inclined to say that, except as an auxiliary to the various lessons, especially reading and composition, it need have no place at all in the primary school; at any

rate, half a dozen lessons in the year, in addition to this incidental treatment, ought to be ample; and these lessons should, probably, not begin till Standard IV. is reached. Before that time, the child's practical knowledge of language is ludicrously inadequate. As well write an essay on "animals" without ever having seen an animal, as discuss the functions of words without having a practical knowledge of those functions. If we wish to "train children to think," let us make them think about real things, plants and animals, climate and nationality, Shakespeare's characters and Macaulay's vivid narratives, and the thousand practical problems that are involved in constructive and expressional work. Even in Standard III., however, the children may now and then be directed to pick out nouns in the course of the reading lesson, to note the apostrophe, the capital letters in "proper nouns," and so on. But the whole thing should be in living connection with speech or composition.

Exactly how much grammar should be taught is a question to which many teachers are at present anxious for an answer.

In the case of nouns, the employment of the capital letter for those of the "proper" class, and for *several other purposes commonly not taught at all* (as in chapter headings, "The Modern Use of Machinery," etc.), should, as already hinted, be dealt with. The threefold classification into proper, common, and abstract is illogical, and should not be pressed home, though it may be referred to occasionally for the benefit of the sharp boy, who, later, may need the grammatical terminology. *Many distinctions may be referred to which need not be made a basis for school examinations.* Number should certainly be dealt with; gender hardly at all. Nouns have no "person" whatever, and never had any, even in Anglo-Saxon. They certainly have a "possessive case," but no "objective"; the former should be dealt with carefully, as the apostrophe is a source of constant trouble.

Pronouns should be "declined" in full, and the fact that one special form (the "objective case"—so called) is almost alone allowed to follow a preposition or transitive word should be impressed. In the West of England bad grammatical mistakes are here frequent; "He hit I"; "Come to we"; occasionally an objective is even used as subject. [By the way, the objective case may apparently be a "subject" in some cases; "He *himself* did the work"; it is a curious fact that grammarians parse "himself" as nominative case!] The relationship of relative pronoun to antecedent should be dealt with, but mainly during the composition lesson, when such faulty sentences as "I sent the piano to the house which cost forty guineas" are being criticised. The use of *that* as demonstrative, as relative pronoun, and as conjunction should be referred to, but mainly in connection with actual reading.

Adjectives give little trouble; their various classes need only a casual reference; the confinement of the comparative degree to cases when not more than two things are under consideration is the only *practical* point that need come up, except perhaps the occasional confusion between adjectives and adverbs.

The present classification of adverbs I have always felt to be absurd; "adverbs of degree" are on a different functional plane altogether from adverbs of manner, time, and place, and seem more akin to "adjectives of quantity." All such matters should be touched upon very lightly, as they have little bearing on composition.

In verbs, the distinctions of transitive and intransitive, regular and irregular, need not be more than referred to, but some time may well be devoted to repeating the three chief parts of such verbs as are often misused—drink, drank, drunk; lie, lay, lain; lay, laid, laid; and so on. Mistakes like, "Cæsar come over to Britain in 55 B.C.," "I done my lesson," are all too common. English verbs have hardly an imperative mood; the subjunctive mood is dying, but should be

referred to in the top class (many people think that "if" is a sign of it—a mistake almost as bad as the one that identifies gender with sex); the best rule for its use appears to be that if the words, "As may or may not be the case," can be inserted, the subjunctive mood should be used;* thus a controversialist of the sixteenth century could correctly say, "If the earth *go* round the sun," but this usage would be illegitimate if he were convinced that the earth *did* go round the sun. It is impossible to say, "If I was you."

Little stress may be laid on "voice"; it presents, I think, no practical difficulty, though it introduces a theoretical one by overthrowing the commonly heard rule that "the subject stands for what we are talking about." If, "The boy was struck by me," means the same as "I struck the boy," it is hard to see that "I" is the subject of the second sentence and "the boy" of the first. Similarly, if I were told that the "subject of a sentence" was "what you are talking about," I should regard "man" as the subject of, "I saw a brutal man beating a horse in the street." Nor in the sentence, "I am convinced he is wrong," does "I" stand for the "sufferer" of any action; at least, the "suffering" is not very acute (except to the children who are parsing the word).

Some genuine mental exercise can be got out of the valid distinction between present participles, gerunds, and verbal nouns; many important writers confuse the last two, and use such expressions as "The fighting the flames."

Very little time need be spent over prepositions, conjunctions, or interjections.

As to analysis of sentences, that process, as already indicated, should be kept close to the study of literature. Whenever there occurs an obscure or inverted sentence, analysis may be a useful means of elucidation. But the supreme folly of past methods has been that analysis, like

* A curious ultra-pedantic use of the subjunctive where the indicative alone is legitimate often occurs. "If this be so," says a newspaper correspondent, when he probably means "If this is so."

parsing, has been regarded as an end in itself—as providing a form of "mental training." Millions of primary school children have meanwhile been silently wondering what the analysis would ever lead up to; and have received no more satisfactory answers than the secondary school boys who have been engaged on equally barren exercises in Latin and Greek. But once we have linked our grammatical teaching to the genuine teaching of language and literature, our pupils will no longer wonder about the sanity of their preceptors.

The above suggestions—mostly negative—are intended (it should be clearly understood) for the primary school only. In that school there is, emphatically, no reason for dealing minutely with English grammar, even if the science of grammar were in a final, or, at least, satisfactory condition. In secondary schools, more can doubtless be attempted, though the closer the master keeps his grammar to his literature and composition the better, even in the secondary school, the teaching will be.

Then as to "prefixes, affixes, and roots." One of the many little printed books containing lists of these should be supplied to each child in the upper standards, together with a dictionary; and every novel word presenting any difficulty should be at once looked up, and its meaning traced back. A few other examples of words with the same root will be then forthcoming. The reading or literature lesson will be the chief opportunity for this kind of work, but it will be by no means the only one; *whenever* a word is new or difficult, even if the lesson be arithmetic or science, it should be elucidated by the pupils in this way. After the etymology book has been in familiar use for a year or two, and many "prefixes, affixes, and roots" have thus been incidentally learnt, I see no harm in the prescription of half a page, or thereabouts, of the book for systematic learning or revision each week or fortnight. The class will have realised the value of the book, and will find genuine interest in mastering

its contents. Similarly, a few of the various French and Latin phrases which have passed into common use should be elucidated by means of the dictionary (*chacun a son goût*, *errare est humanum*, etc.), and the pupils be thus put on the road for further elucidations by the same means. Possibly, a little French could be taught, along modern lines, as a part of the regular language lessons of the school, enough to remove from the really clever child the feeling that a "foreign language" is invincible for such as he.

In a book like the present, in which the word "romance" has been frequently used, the reader will feel no surprise at my suggesting that there is a "romance of *words*." The works of Trench* and Isaac Taylor,† and the classical passage in Ruskin's *Sesame and Lilies* in which Milton's *Lycidas* is discussed, will serve to show what I mean. As Mr. F. J. Gould says, "The young student should be taught to love and reverence words as wonderful vehicles linking past, present and future." How interesting is the history of names of people (Christian and surname), of wild flowers, trees, places, and such like!

The chief objection raised to the above plan will be that it steals time from the reading lesson. Of course it does; but I am assuming that there will be many "reading lessons" in the course of the week, though they may be called lessons on history, geography, literature, recitation, or sometimes, perhaps, even science. The term "reading lesson" must be widely interpreted; and at any moment the teacher must be prepared—not "to wander from the point" or to "violate the time table," but—to elucidate the points, literary, historical, grammatical, or what not, that spontaneously present themselves. I know of no other way to make the "English subjects" living subjects.

---

* *The Study of Words.* † *Names and Places.*

X.

LOGIC.

"Logic," in the Primary School!

Well, I do not advocate logic as such. It died some hundreds of years ago, and its resurrection in the "inductive" form is too recent for the schools to reap much benefit yet.

But one or two pertinent facts may lead the reader to the opinion that, for a Standard VII. or ex-VII., and still more for classes in secondary schools, a little acquaintance with the chief *pitfalls of human thought* might be as valuable as a knowledge of mystic, or non-existent, "objective cases."

Logic and Logic.

First, let us remember that we live in a democracy, and that electoral contests of some kind have, almost every year, to be decided. Such a system is absurd unless a good majority of the voters have reasonable powers of judgment—not judgment on minute matters of specialisation, but on the broad issues of political and social life. More particularly, they should have a reasonable power of seeing through fallacies.

Secondly, we do not forget that, according to the "faculty psychologist," there is a "faculty of reason" located somewhere in the mind or brain. Now subjects like grammar, arithmetic and science are alleged to sharpen this "faculty." After a course of work on irregular verbs and the like, we are supposed to be able to judge soundly of the fiscal question or of woman's rights. Unfortunately, this plan does not seem to work out very well, apparently because of the difference of subject-matters; "reasoning" in one department does not flow over to another as it should, according to the school management books. "Formal training" and "faculty training" are, in short, exploded dogmas; if we wish to cultivate a man's "reasoning powers" so that they will deal efficiently with political, civic and social matters, there is only one way

we must *discuss political, civic and social matters with him*, give the *pros* and *cons*, and, perhaps—teach a little logic. Needless to say, the proposal is scarcely practicable with our present curriculum, least of all in schools of special difficulty; but I think there is some scope for it even now in certain upper classes, more particularly in connection with the improved teaching of literature and history, and the possible teaching of civics.

Fallacies.

But if attempted at all, it should be largely incidental and—*highly practical*. When, in the course of the reading lesson (or of the private study that will figure so prominently in future school work), some statement occurs in which may seem to lurk a fallacy, *then* will be the time for the teacher to discuss the matter, and possibly to introduce a few more illustrative fallacies of the same kind. The *names* of the leading fallacies are extremely useful, *e.g.*, "equivocation," "non-observation," "false analogy," "illicit generalisation," *petito principii* (assumption of the conclusion), above all, *ignoratio elenchi* (proving the wrong point) and *post hoc ergo propter hoc*. I think that with teachers who have an interest in this subject, a B.A. examination to sit for, and an upper standard to teach, a few specific lessons under the head of "history" could be given on the great blunders that the human intellect has made in its upward march; for example, the equivocation with regard to the word "nature," and the "non-observation" of the law of falling bodies. Any good recent book on logic * will provide the teacher with a list of fallacies and with copious examples of them, but the value of the subject will only be realised if there is a daily watch for fallacious arguments. School debates offer peculiarly good material. To prove that a "second chamber is highly valuable" is a mere case of *ignoratio elenchi* if the subject of debate is "That the House of Lords, as at present constituted, should be abolished." And every

* The second volume of Professor Welton's *Manual* is here very instructive.

objection brought against a new proposal is almost invariably an objection equally applicable to things as they are (*Tu quoque* argument). Let the reader put this statement to test for himself; the result will so astonish him that he will begin to doubt the mental lucidity of the human race. And in addition to a treatment of logical fallacies, there may be some reference to such characteristics as the English hatred of system, and love of a middle course;* and also to such universal characteristics of mankind as readiness to accept opinions on trust.

History, literature and civics would certainly gain considerably from the treatment here imperfectly outlined. But there is another subject that would also gain. We hear much of the value of a "training in scientific method." I think that the narration and discussion of a few of the triumphs of science over ignorance would not only be an excellent form of "moral instruction" (because of the biographical element involved), but an excellent clarifier of the mind. Boys would learn the meaning of "induction," "crucial instance," "hypothesis," and so forth. Needless to say, "definitions" are not here very necessary; we do not want to kill the old formal grammar in order to install a barren formalism of another kind; all our teaching should be rooted in broad, interesting, pertinent, arrestive examples, such as Darwin's researches on earthworms, or Rayleigh and Ramsay's discovery of argon. The lesson can be called "science," if we like, the word "logic" hardly or not at all crossing the teacher's lips, and certainly not yet finding a separate place on the time-table.

Scientific Method.

I have failed entirely in the preceding sections if the reader has not drawn the following inferences: (1) There must be a vigorous and persistent attempt to "make boys think"; Herbartians do not talk blatantly about the "faculty of reason," but they would be poor guides if they neglected to cultivate

* "The English think every proposal extreme and violent unless they hear of some other proposal, going still further, upon which their antipathy to extreme views may discharge itself."—Mill's *Autobiography*.

the process of thinking; (2) But the "thinking" must not be in a partial vacuum; there must be *plenty of things to think about*, excellent reading material, nature work in abundance, and so forth. Herbartianism is not "soft pedagogy," it is very "hard pedagogy" indeed; but though it expects boys to work hard and to think hard, and thus to prove that they have genuine "*interest*," it provides them with material in such abundance that they enjoy the hard work and the hard thinking involved. There is undoubtedly good reason for the complaint that boys and girls are not made sufficiently self-reliant by our present educational methods. I know of no remedies for this except (1) the constant employment of heuristic or research methods, not merely in "science," but in history, literature, and other subjects, a method excellently summed up in Professor Adams's words, "Not propositions, but problems; not judgments to be made, but ends to be attained"; (2) the equally constant adoption of a *critical* attitude towards all material presented; (3) a considerable increase in "practical," "motor," "expressional," or "occupational" work, so that the school may be, in a measure, assimilated to the future activity of the child. But, as a background to all this strenuous endeavour, must be provided *a panorama of significance, meaning*, and *romance*, or the strenuous endeavour will degenerate into task work, and the school will become a prison.

The Situation Summarised.

(F. H. H.)

CHAPTER XVI.

School Music.

I.

THE FUNCTION OF SCHOOL MUSIC.

THERE can be no possible doubt respecting the high value of Music in a scheme of education, and yet no other subject of the school curriculum receives such varying treatment. Not only does the musical standard vary greatly in schools of the same type, but amongst the teachers in the same school one often finds great divergence of opinion as to the importance to be attached to the teaching of this subject. Few teachers, however, would wish the singing lesson omitted from the time-table, no matter how sceptical they may be of its educational value; for they would at least admit that the singing lesson is entered into cheerfully and heartily by every normal child.

Perhaps it may be urged that the interest displayed by the scholars is of a transitory nature; but singing, properly taught, certainly arouses permanent interests, and through its influence there may be induced in the scholar such a frame of mind as will lead to his putting forth vigorous effort in other subjects, and thus to an increase of his self-activity.

But apart from the pleasure which children derive from the singing lesson, vocal music has other and stronger claims to a place in the curriculum; for physical, mental, moral and

æsthetic advantages are to be obtained from the right use of singing.

Now, the art itself falls naturally into two distinct parts; (i.) the production of musical sounds by the vocal organs, and (ii.) the power of using those sounds as a medium of expression.

What Constitutes Singing.

(i.) The first of these—the physiological basis of singing—has not received that attention from teachers which it rightly deserves. The foundation of all good voice-production rests upon the proper management and control of the breath, upon perfect looseness of the throat and the tongue, and all the muscles of articulation, and also upon obtaining the greatest resonance on each vowel throughout the compass of the voice. It is in this matter of resonance that the trained voice differs most from the untrained one. The poor quality of tone in the latter is chiefly due to lack of resonance. Now, resonance is only to be obtained by making use of the chest and the cavities of the mouth and throat which are capable of beneficially affecting the column of air (increasing its amplitude of vibration) already set in vibration by the action of the larynx.

Good singing also implies proper nerve-control. To quote an eminent medical authority, "In the act of singing, the muscular sense (*i.e.*, the sensation derived from muscles in action), is displayed in its highest delicacy and precision." Further, "Two totally different sets of nerves, running between the larynx and the brain, are involved, the one sensory, the other motor, but both indispensable." Hence it is evident that to learn how to sing properly and economically, special training is necessary; and yet how few are the teachers sufficiently acquainted with the movements involved in singing, or with the methods of voice-training, which alone will procure good tone! The fact is that, in the training of teachers the educational importance of singing, along with that of other forms of motor-training,

has, until recently, been much neglected; and this, in large measure, may account for the small esteem in which the subject has been held.

We hear much to-day of the need for more motor-training in the schools. Proper training in voice-production—and this includes the speaking-voice, which is best trained by the practice of musical sounds—will provide profitable motor-training, which will not only benefit the scholar's health, as, for example, by teaching him proper methods of breathing, but will also ensure the correct use and conservation of the vocal organs.

(ii.) To use the voice as a medium of expression implies perception of shades of emotion and a sense of beauty, and thus the singing lesson, rightly used, will afford valuable opportunities for sensory-training. A class often sings crudely, simply because the scholars have no other conception of singing. If these same scholars are made to listen to good tone, and to appreciate it, then, and not till then, will they begin to produce it themselves. The attempt to obtain good tone must thus, in the first place, be made by an appeal *through the ear*. Impression must precede expression. Because of the opportunities which singing affords for sensory training, it is worthy of a place amongst those subjects (*e.g.*, literature) whose value is chiefly cultural.

Singing as an Expressional Subject.

Music should be a refining influence in the school. A boy who will fail to appreciate any other form of beauty will appreciate a beautiful song. In fact, a good song is one of the few perfect art-forms which a teacher can easily bring to the notice of his pupils, and one in which he can be certain that the majority of his class will be interested. Through the music lesson the teacher can build up a standard of taste, not only in music, but also in poetry. The words of good songs are seldom forgotten; indeed, they are often affectionately remembered. The charm of a song, its rhythm and poetry,

can be well brought out, and the æsthetic advantages of singing become evident.

Singing appeals primarily to the emotions: children like to express their emotions through music, and, to express emotion, intelligence and imagination are essential. We should therefore welcome singing since it opens up for the child another avenue of self-expression. And the singing-lesson can be made to stir the very depths; it provides the teacher with opportunities of rousing the child's emotional nature—too often dormant—into *wholesome* activity. In this way it is possible to give the scholars a new spiritual environment, and thus singing acquires a powerful moral significance.

These advantages will be reaped only when the teacher is possessed of true musical feeling, and he must bear in mind that it is far more important to develop in the child the sense of the beautiful in music, and to imbue him with a real liking for the subject, than to aim at making his pupils acquainted merely with the machinery of music.

To develop musical taste we must take care that only the best available school music be used. Songs "written down" to the level of the children are to be avoided as much as doggerel poetry. Great care should be taken that the words of a song are suitable to the capacity of the children, and that at the same time they are satisfactory from the literary point of view. When the music is wedded to some of the finest poetry, as in Schubert's settings of Shakespeare's *Who is Sylvia?* and *Hark, hark the lark*; Somervell's setting of some of the children's verses of R. L. Stevenson; or the setting of *Drink to me only with thine eyes* (Ben Jonson)—the scholar gains an acquaintance with good poetry, which often lasts a lifetime. School songs may, in this manner, become a valuable method of introducing the child to the lyrical gems of the English language, as, fortunately, the greatest song-writers have nearly always wedded their music to good poetry.

The Choice of Songs.

Interpretation of Songs.

Where good songs are taught, the reading and literature lessons are bound to be benefited. To obtain a proper interpretation of a song the scholars must be made to understand the words adequately — the figures of speech, the meanings and allusions —and when these have been lucidly explained, the children may be trained to appreciate the spirit of the poetry and its musical setting. All such teaching will help to develop the dramatic instinct. Thus even a junior class (Standard II. or III.), in singing *Going to Bed*—the setting by Somervell of Stevenson's poem, commencing "All round the house is the jet-black night"—can be trained to bring out the meaning and spirit of the poetry, and, what is more, they will enjoy doing so. Such a song as Schubert's *Erl-King*, with its dramatic treatment, might be sung to the children, and they would gain an insight into musical expression—how the composer has depicted the galloping of the horses during the whole of the journey until the door is reached, and the surprise of the father when he finds the child dead in his arms.

In choosing a song, particular attention should be paid to the rhythm. The feeling for rhythm is instinctive, and an attractive rhythm will go far to interest a class in the song they are learning. Here, again, the singing lesson may be linked up with the literature lesson. The metre of a poem determines the time in which the music setting shall be written, and scholars can soon be led to see that such an anapestic line as—

"The Assyrian came down like the wolf on the fold,"

would be put into three-pulse measure (in secondary form) thus—

| : The : As | syr : ian : came | down : like : the | wolf : on : the | fold ||

While such dactylic lines as—

"Take her up tenderly,
Lift her with care."

would be put into three pulse measure (primary form), thus—

| Take : her : up | ten : der : ly, |
| Lift : her : with | care : — : — ||

Children accustomed to marching to the piano will easily be

led to notice that march-tunes must be written in *two*-pulse (or some multiple of *two*) measure, so that the strong beat and weak beat correspond to their stepping out on the left foot and right foot respectively. Treated in this manner, the time exercises in the music lesson will not be the meaningless, uninteresting things they so often are.

Teachers very often underestimate the musical capacity of their pupils, and have therefore been led to ignore the many classical and modern songs which can be taught in school. Thus, in a poor London school it has been found possible to teach the children to enjoy such songs as the following:—

Schubert: *Cradle Song. Who is Sylvia? Hark, Hark the Lark.*
Mendelssohn: *O, for the Wings of a Dove, On Wings of Song.*
Sterndale Bennett: *May-dew.*
Tschaïkowsky: *Pimpinella, Chant sans Paroles.*
Rubinstein: *The Angel.*

When one remembers that town children (and to an ever-increasing extent, rural children too) come to school with a strong bias in favour of songs of the music-hall and the street, it will be seen how very important it is that careful attention should be paid to school songs, and that only the very best music should be put before our scholars. Recently much stress has rightly been laid upon the teaching of national and folk-songs, and at least two of this type should be taken each year. A comprehensive list is given in the appendix to the *Suggestions to Teachers*, and in this list will be found some beautiful songs.

Teaching by Ear.

Of course, this better-class music cannot be attempted where teachers still adhere to the notion, formerly so prevalent, that songs must never be taught by ear. If scholars are to be introduced only to those songs which they can read with ease, then the field from which school music can be selected becomes very limited, and the opportunities for developing musical taste are

greatly curtailed. But, surely, it is better to introduce a new rhythm or to teach a new and perhaps, difficult, interval in a song that is being taught by ear than to present the same difficulties in the shape of uninteresting (and often meaningless) chart or blackboard exercises. We should bear in mind that music ought to be taught as a language and as literature, and that, as in all language teaching, sound is more important than sight.

Unison v. Part-Singing.

The recent movement which has led to the substitution of unison songs for much of the part-singing so often attempted in schools is a step in the right direction. One has known instances, by no means rare, where young scholars (Standard IV.) have been taught three-part songs, and the harmful effect of these young scholars attempting to sing low notes has been overlooked by the teacher in his pride at the ability of the pupils to sustain their various parts.

Where unison songs are attempted, it is a great advantage if a piano accompaniment can be secured. Most schools nowadays possess a piano, and where some member of the teaching staff is able to accompany sympathetically, singing should make good progress.

When a scholar has passed through the various standards, he should possess a fairly large repertoire. A scholar should never be allowed to forget entirely the songs learnt lower down in the school. When a song has proved a favourite with a class it should be practised in later times, and in this way it would be quite possible to build up a school song-book. This is done in several public schools. If such a collection also included a few good marching songs, and songs dealing with sports and games, and other phases of school life, its use would do much to develop *esprit de corps* in the school. It would also help greatly in banishing the music-hall type of song, which is too often the only resource of our scholars when they need an outlet for their exuberance on school excursions and at holiday times.

Just as much care should be exercised in choosing school hymns as in selecting songs. To open school, morning after morning, with such a hymn as *Art thou weary, art thou languid*, is not calculated to rouse the scholars to vigorous effort in the lessons. And in the singing of the morning hymn, it is quite as necessary to insist on good voice-production as it is in the singing lesson; yet the singing at morning prayers is often much inferior to that of the singing lesson, and little attempt is made to improve it. The morning assembly in the school hall also affords a fine opportunity for the practice of a few breathing exercises and voice exercises. If these are carried out each morning they will do much to eradicate bad habits, and soon there will be a decided improvement in the singing throughout the school. Such daily practice is of the very greatest value.

With regard to the time to be given to singing, it will be found that a twenty minutes' lesson early each morning produces very good results. Throughout the whole school it should be borne in mind that singing is of great value as a means of happiness, and that tasteful, soulful singing should be aimed at rather than the perfect mechanical efforts of correctly performed time tests and sight tests. The latter, however, have a value all their own, and should not be neglected. The child needs to be taught how to read music; it is specially necessary that scholars should be shown the connection between the Tonic Sol-fa and the Staff Notations; and it is not at all a difficult matter to make an upper standard boy fairly proficient in reading from the Staff Notation. But technical skill should not be the first consideration, as it has been so often in the past. It has been wittily said that "Singing is the only heavenly hobby on earth, and the only earthly hobby in heaven," and though we hope it is clear that singing is not "merely a skill subject, involving sheer imitation," as some educational writers have maintained, yet it is on the recreative side of the subject that special emphasis should be placed.

(H. M.)

II.

VOICE TRAINING.

THE chief element in Singing is voice. The words "voice" and "vowel" have the same root. There is no voice without vowel sound. The substance of voice is vowel sound. Vowel sound alone does not make words, but vowel sound alone does make voice. Consonants are not sounds. They signify what part of the articulating apparatus is to be used to modify the vowel stream. They do not make voice; they mar it. The first object in singing is therefore the production of pure vowel sound. If this is not achieved, there will be no singing worthy of the name, though there may be splendid sight-reading (a very different thing). Singing is for the purpose of being heard and admired. If it does not reach at least as far as that, it is a complete failure. And indeed, it ought to aim higher than that. It should be such a "thing of beauty" as to create in the mind of both singer and hearer an impression so vivid that it can easily be reproduced in those minds, and thus be also "a joy for ever."

Voice and Vowel.

One of the mind's marvels is that, though impressions are gathered up in successive order, they can be reviewed simultaneously. Any musical rendering can come up for judgment, exactly as a picture. If it is a worthy rendering, the audience will be busy storing up impressions. On completion, they will have a perfect photograph—stereoscopic, and in colours.

A Perfect Song, A Perfect Picture.

A picture is seen by means of light, and light waves are carried through the ether. Sounds are carried through the air—a denser medium, and one in which our whole bodies can vibrate. Even the externally deaf may hear, by feeling vibration through some other part than the defective organ. Perhaps a stronger impression can be made by means of sound than by any other form of Art.

Difference Between Painting and Music.

A consonant not being a sound, any effect made on a hearer by means of singing *must be produced mainly by vowel-tone*. Vowel-tone is unimpeded vibration of the vocal ligaments. The sound thus produced may be called neutral vowel sound. It is the substance of voice, and any interference with it will lessen the amount of voice produced. The art of singing commences with this neutral vocal tone, for this is the fount and origin of voice.

What is Vowel-Tone?

Sound for singing is produced, then, by the air-stream from the lungs passing between the edges of the vocal ligaments. The air has first to get into the lungs. The vocal ligaments will vibrate on inhalation as well as on exhalation, though the only use made of this source of sound is in certain dramatic effects outside the scope of vocal music, at least at present. Air should be inhaled through the nose, and the habit should be learnt for other purposes of life. The advantages of it are that dust and possible microbes are excluded from the lungs, air is admitted at a regular temperature, any excess of moisture or the want of it is tempered; but the chief advantage in singing is that of excluding cold from a part greatly heated by action. The use of any part of the body determines the circulation of the blood more rapidly to that part, and the temperature there is maintained to the highest degree; it is of the greatest importance that there be no sudden checking of the temperature. Much sore throat and loss of voice is caused by the want of this precaution.

Nasal Breathing.

If any difficulty be found in acquiring the habit of nasal breathing, it can be practised when walking by keeping the lips shut. It is not at all necessary to keep the mouth shut after the habit has been acquired. An intermediate step is to breathe while the tongue is placed against the soft palate, thus excluding air from the larynx by way of the mouth. Then the final step may be practised with

the tongue placed in the bottom of the mouth with the latter wide open. That the air should be exhaled through the nose is not perhaps of so great importance, yet it should become a habit if only for the fact that the air issues untainted by any temporary foulness of the mouth or of the stomach. Moreover, the lungs should not be exhausted suddenly. Of course this exhalation by the nose should be practised when singing is not being attempted.

It will be found that whatever be the quality of the vowel tone first produced it will not be steady. It will flutter and ebb and flow. It will pulsate with the heart-stroke.

The Heart and Lungs.

The lungs have never been trained to breathe steadily enough for singing purposes. Their action has been rapid and jerky. The heart has never been trained to pulsate steadily. It disturbs the voice at every stroke. Can control of the heart-beat, then, be gained? Directly, no; indirectly, yes. The heart-stroke follows the action of the lungs. Let the breathing action be trained and the heart follows suit. This breathing action can more profitably be obtained while singing than in an isolated exercise. In this way excess can be avoided. It is as easy to develop lung as it is to develop the biceps. *Cui bono?* The lungs may be expanded until the chest becomes like that of a pouter pigeon, and in the result may be a positive burden in singing. Enough is as good as a feast; and one may have too much of a good thing.

It is better to begin with the quietest sound that can be made, for the pupil can better notice the disturbance that arises from the unsteady exhaling. The class should be directed to hold a tone of a pitch about the middle of the average compass—say A, second space, treble clef. No pulses need be counted. Let the long breathers continue to their full capacity after the short breathers cease. These latter must not be allowed to start again until all have finished one breath. All must be stopped before the tone gets unsteady

The First Note.

through exhaustion. The object of the exercise is not to see who can hold out longest or how long a sound can be produced, but to educate the breathing power in the proper production of a musical tone. This exercise can be repeated three or four times. It will be found that the later breaths last much longer than the earlier ones. The reasons for this are, first, that the air is exhaled more slowly by practice, and, next, that more air can be let out of the lungs.

Air Tides.

Physiologists divide the air stream into several tides. The first is a shallow one, required for ordinary actions. Next is a deeper one, which is used in greater exertions. Last of all is the air contained in the lower parts of the lungs, only exhausted in times of extremity.

Lungs, Blood, Brain.

As one breathes so one lives. All the viscera partake of the motion of the lungs. The deeper the breath, the more the life. Hence the extraordinary elation, amounting in many cases to ecstasy, experienced by well-trained singers, and communicable to those in sympathy with them. It is also the fact that the well-developed action of the lungs is the basis of all physical and mental power. It means more blood and better blood. The brain also pulsates synchronously with the lungs, but in opposite periods, the brain expanding while the lungs contract, and *vice versâ*.

No Interference with Musical Tone.

A steady musical tone is now secured, though it may be small. The next step is to make the most and best of it. The sound begun must be magnified by the resonance of the whole body. This is not so much a question of standing or sitting. There must be enough interest taken in the subject to induce an eager attitude—an athletic attitude. There must be a musical tenseness that will not absorb sound, but reflect it. Take a lesson from the soft palate. At the very suggestion of a sound proceeding, it automatically hardens.

The tone may be strangled at its very birth. The last result of the effort of the singer depends on how much of the air in the audience chamber has been thrown into vibration, and to what extent. In emitting tone, the most important and the most neglected details are the form and direction of the mouth. The proper opening of the mouth certainly needs teaching, and attention must be given to its position. The first factor is that the top jaw cannot be raised, except by tilting the head. The next is that the mouth can be opened only by lowering the bottom jaw. Standing before a mirror in an erect attitude, and singing a vowel, it will be seen at once that the mouth is directing the sound downwards, instead of outwards. To counteract this the head should be tilted backwards a little.

Mouth Drill Indispensable.

This point gained, attention should be directed to the quality of the tone. "Breathiness," or the sound of the breath escaping, is generally caused by forcing the breath through the vocal ligaments. Compared with ordinary breathing, the sensation should be rather that of restraining the air. It has to last longer.

Efforts must be made to open the mouth wide. It is not always necessary or desirable to sing with the mouth stretched to its utmost, but the student should be able to open it to its widest capacity at will. The exercise may stretch the facial muscles and make them ache. Particular vowels may now be attempted. Let the class try a long-held note, with the object of ensuring that the mouths are properly open. It is astonishing how big they feel to the user, and how small they look, and are. The exercise can be practised by the mouth being kept open while alternately singing and resting, beating in twos. That is, stop the sound, but keep the mouth open.

Wide-Open Mouth.

As soon as open mouths are secured, a song may be vocalised—that is, sung to a particular vowel in the language.

In English, twelve simple vowels may be considered; and five diphthongs, or double-vowels. Each requires to be known by itself, recognised in words at sight, and its utterance mastered, both by itself and in conjunction with any succession of vowels or consonants.

Vocalisation.

They were very well selected by Pitman for his shorthand system. For singing purposes they may be varied thus:—

I.	II.	III.	IV.	V.	VI.
Pa's	cur	she	thought	so	poor.
VII.	VIII.	IX.	X.	XI.	XII.
That	pen	is	not	much	good.

Five Diphthongs.

VII.+XII.	I.+IX.	IV.+IX.	VIII.+IX.	IX.+VI.
(1) Now	(2) my	(3) boy	(4) play.	(5) tunes.

There is a little controversy about these elemental sounds which perhaps will continue until a standardising vowel machine is made. The difficulty depends partly on local pronunciation, some of which is degenerate. The shape of the mouth differs for each of the twelve simple vowels, but not at all in the direction of closing. They are each and all to be practised until any one can be produced at sight with wide-open mouth. The diphthongs are sung to the first of the double vowels and then changed to the second at the instant of quitting the syllable. It is the attention given to these vowels that marks the trained singer from the presumptuous novice. Where there is vowel there is voice. These vowels can be practised to well-known songs.

Wide Mouth for all Vowels.

The class should vocalise a song twelve times for the simple vowels and five for the diphthongs, not necessarily during one lesson, although there is no reason against that. The class will be wonderfully interested in this, first because it is novel, and secondly because they will instinctively know that they are gaining voice. This vocalisation can be practised in three distinct ways; first,

Interest in Vocalisation.

the "Marked," where each note of the melody bears a slight accent on the vowel used; second, the "Unmarked," where the voice passes smoothly on from the beginning of the breath to the end; third, the "Staccato," where a slight stop is made after each note, the mouth remaining open. The teacher should in all cases pattern the vowel to be used and the method of using. These studies in vocalisation should continue until a complete rendering of a song can be given including all variations for expression.

"'Tis not in mortals to command success,"

but after a song has been thus practised, success will be deserved.

Italian Solfeggi Names.

It is very interesting to note that the Solfeggi names were originally used for the very purpose of giving vowel practice, and thus developing the voice:

Do (Ut) Re Mi Fa Sol La Si Do

In modern "solmisation" Do has supplanted Ut. They were derived from the initial syllables of a Hymn to John the Baptist for use in vocalisation, and not at all with the idea of identifying the steps of the scale, as now. It will be observed that they contain (reckoning modern Italian pronunciation as that in which they were most likely rendered) a good selection of the simple vowels detailed above.

VI.	VIII.	III.	I.	X.	I.	III.	V.
Ut	Re	Mi	Fa	Sol	La	Si	Do

The identification of these vowels matters less than the fact that at an early period it was found necessary to vocalise for the purpose of teaching singing, and this by the most famous singing nation in the world.

Vocalisation.

The importance of this part of the subject can scarcely be exaggerated. Vocalisation is singing as distinguished from talking (indifferently) to notes. Words will destroy voice unless they are carefully produced. At each consonant the mouth must be shut or the

air-stream stopped, and unless the mouth be instantly re-opened voice is lost. A difficulty arises in passing directly from one vowel to another (hiatus). It occurs fairly frequently, and if not detected the singers may put in a very objectionable consonant:

"Against the law of Moses" becomes
"Against the law-r of Moses."

The remedy is to keep the mouth open while changing vowels.

Consonants.

As consonants stop the air-stream, they are to be treated with full justice, but must be practised until they can be performed in the shortest possible time. (See "Phonetics.") It is true that, for certain dramatic effects they may be emphasised, even at the cost of less voice.

"Now this man ceaseth not to utter blasphemous words against the law of Moses."—*St. Paul.*

"Affrighted fled Hell's spirits back in throngs;
Down they sink in the deep abyss
To endless night.
Despairing cursing rage attends their rapid fall."—*Creation.*

In whatever way the consonants are learnt for speech, for singing they must be sung, that is, practised in a singing voice to a prolonged vowel, both initially, finally, and in any combination. The great point in the art of singing is *to get away from the consonants to the vowels as quickly as possible.*

A musical voice is now developed capable of producing properly sounds that have an intelligible verbal meaning. The art of singing is by no means complete yet. Listeners would be oppressed with monotony if they heard vowels trolled never so purely, and consonants chiselled never so clearly. *Expression* has to be learned. All Art, to be true to life, must have contrast. It should be good in substance, with variations of that good. There must be "Day and night, and summer and winter, and cold and heat." Good substance in song is made of pure vowel tone. But how

shall be obtained the pulsation of life? The means of expression are changes of force and speed.

How to obtain Expression—Pianissimo.

The most difficult grade of force to obtain from a class is a sustained *pianissimo*. The proper standard can be set by requiring the class to sing whole songs with lips closed—humming; next with mouths shut, but with lips slightly open, still without words. As soon as the class hears its own standard of what is expected for *pp.*, words can be allowed.

Sotto Voce and Mezzo Voce.

For *sotto voce*, or "hidden voice" effects, the jaws may be kept shut and the lips just slightly open. For *mezzo voce*, or "half voice," the jaws may be apart, but the lips still only slightly open. Then these grades of force can be imitated with mouths wide open. Again, whole songs should be practised in these different styles, with and without words. It will be very difficult to get the proper contrasts of force and speed, unless the standard of each has been set separately in this manner.

Fortissimo.

The next grade attempted should be the greatest contrast to the first. The best way to introduce this is to direct the class to commence a tone *pp.*, and during one breath increase to the loudest possible force, and return to *pp.* The teacher should beat slow measures of common time, directing that the force increase through the first measure, get loudest on the first pulse of the second measure, decrease to the third pulse, and rest on the fourth; the process may then commence again either on the same note or up and down the scales. In these exercises for expression, an accompaniment, on piano or harmonium, is invaluable. It sustains the pitch, adds the interest of harmony, and the teacher can suggest the gradation of force, counting the speed by marking with chords on the instrument instead of beating time. Every note in the compass of the class should be developed thus. It is better to work down-

ward from a note about the middle of the average compass, say A, second space, treble clef. Every scholar will be able to start there. It matters little whether the notes follow diatonically or chromatically.

Compass, Soprano, Alto.

Let there be no assumption as to how high or how low the scholars should go. The teacher must be guided by what he finds. The class should not be allowed to proceed to extreme limits, but should be stopped when the object of the exercise is not being fulfilled; that is, the power of increasing the force of the tone to *ff*. It may be taken as an axiom in singing that any note in a voice which cannot be sung with expression might as well not be there. This is the utter weakness of the falsetto voice and a certain test for its identification.

Head Voice, Chest Voice, Registers.

In these exercises nothing need be said about "registers of voice." There is absolute safety because each note is to be commenced and quitted *pp*, and always on a vowel chosen by the teacher. No "method" should always insist on quiet singing, head voice and so on; where is the expression? It is not there because the singers are deprived of one of their means. Children should be taught to sing loudly in the right place, and not to attempt to conceal faulty voice production by hiding or minimising the defect. What would be thought of a "method" of teaching writing, which said "I cannot teach you the proper shapes of the letters, but in order that your writing may not look very ugly *write very thin*," thus depriving it of any character.

We are commanded to

> "Sing unto Him with a new song,
> Play skilfully *with a loud noise*."—Ps. xxxiii. 3.

Head voice means head resonance and chest voice means chest resonance. The fact is that all parts of the body resonate more or less with certain vowels and certain pitches. If attention be directed to the production of pure vowel tone,

soft and loud, the registers will look after themselves. When scales are substituted for single notes it is safe to commence at the top and work downwards. This is very good for the mechanism of the voice, but it will teach only one element of the rules of expression. The foregoing exercise (attempt for *ff*) not only gives the power, but indicates when the power should be used: on every note where there is time to vary the tone an increase and decrease of force should occur.

Resonance, Head, Chest.

The next exercise in expression should illustrate the next law. It is that all ascending movements in pitch should increase in force and speed; and all descending movements should decrease in the same. Passages of three notes should be given rising (or falling) a certain interval, and returning to the same note. Each note can be held for four pulses. The teacher should beat (or play) faster when approaching the upper note and *vice versa*. These rules run the gamut of the laws of expression.

Ascending and Descending.

Nothing is here said of expression derived from the words. That can be safely left to the teacher's literary taste. Let the rules be applied with a bold hand. The *ff* must be very loud: the *pp* very soft, and every step of rising and falling should be heard louder and quicker, softer and slower respectively. Easily said, not easily done. But with these points mastered, singing is full, grateful to singers and listeners alike.

III.
SONGS.

"How to sing" is a much more important, because a much more difficult question, than "what to sing." There is much more bad singing than bad music; he must be very hard to please who cannot find thousands of good songs on the Requisition List of his Education Authority. It is well to be careful

Choice of Songs.

in the choice, for all the musical taste developed and the musical knowledge gained can be based on the songs selected. What should the child be taught to sing? It is better to commence with what the child will sing, or will like to sing, or can sing, as long as there is no good reason against it. There are two considerations: first, what the musical status of the pupil is; and secondly, what it might be. In selecting songs, the first thing in importance is the music, not the words; but as the child's literary education is in advance of his musical training, words should be taken into account and have intrinsic interest, the teacher thus attracting through one path to another. Of the two elements in the music—notes and rhythm—let an attractive rhythm be a good guide. The Board of Education's "Suggestions to Teachers" recommend collections of songs. Progress will be rapid where each scholar has a copy of songs printed in both Staff and Tonic Sol-fa Notations.

How to Teach a New Song.

Having chosen a song, the teacher should sing it to the class or get a scholar to do so. Let the class hear the songs one after another in some of the early lesssons in the school year. "Five songs are the minimum" (*Suggestions*). "The more the better" (*Instructions*). Sing one of the songs on several occasions until it "catches on." Now the class will wish to sing it. In fact, after the first hearing, if it is going to be a favourite, the scholars will have to be restrained from joining in. They may be allowed to join in very quietly, so that they can easily hear the teacher keeping them on the right track. Then perhaps a pupil with a quick ear will get hold of it; let him or her sing it alone, the teacher guarding quickly against any mistake, for that will be a weed difficult to eradicate. It may be objected that this is "teaching by ear." The answer is that, This is no time for deductive methods; one cannot get blood out of a stone; let us sow before we reap. There are to follow Note Tests,

A New Song.

Time Tests, Ear Tests. "The chief appeal is not to the intellect" (*Suggestions*). The function of the intellectual part is to examine the emotional expression, to correct and guide it. But expression must be got first and anyhow. All interest will be killed by making the scholars *read* a new song.

Musical Knowledge from the Songs.

After the class has learnt the song or songs by ear, let the songs be sol-faed from the books. Then they may be pointed on the Sol-fa modulator and afterwards on a Staff drawn on the blackboard. "Lines of Staff not less than three inches apart" (*Suggestions*). It is advisable to place a scale of notes extending throughout the compass of the song. This method will lay a foundation for the Tests. A set of Music Readers, printed in Staff only, should be supplied. Give the key note, and let the class find the pitch of the first note and its Sol-fa name. Proceed one note at a time, stopping after each until the teacher says "next." Correct any note wrongly struck and pass on. As the class gets proficient let them read straight on. Treat time tests in the same way. The pupils should be taught to beat the time. Insist on proper accents from the first; they should, indeed, be exaggerated. The ear tests are rightly regarded as the most difficult of all. They are best taught in an indirect way, by bringing plenty of music within the pupil's reach and by thus increasing the amount of musical material within his knowledge.

British Music.

"Can the Ethiopian change his skin or the leopard his spots?" Why should he? "British Music" as a term generally carries with it a half-hearted apology for claiming that there is such a thing. This feeling is bred in ignorance, and will disappear with the clouds that obscure the real state of affairs when the truth is made known. Are we a musical nation? Were we once a musical nation? I intend to show that we were, and are just coming into our own again. Everything depends on the schools and the teachers. Should we copy others? No. Should we

learn from others? Yes. Is anything to be learnt from us in music? I think so. Can we learn anything from others? Certainly, in music as in all other things. "We are not too old to learn if we are not too proud to be taught."

Is it correct to speak of "nationality in music"? Certainly, although music is a universal art. What are we to call good or the best in music? That form which expresses the good or the best in humanity. How shall we judge of this good? By considering the use that certain forms are capable of employing. What is the use of music? The chief use of music is to be a vehicle of the expression of good emotions, and thus an antidote to the baser emotions, passions, or vices. Thus, when David played upon the harp Saul was refreshed, and all was well, and his evil spirit departed from him. All instruments after their kind express differing human elements, some more of the emotional, some more of the intellectual. The wind instruments, because of their need of breath, are more nearly connected with the life of the emotions, while the stringed instruments, with their greatness of speedy execution, more fittingly express the rapidity of thought. Vocal Music is the expression of the human instrument and, therefore, takes pride of place.

The Use of Music.

Britain has, almost from time immemorial, been pre-eminent in vocal music. The Hebrews are great in their traditions of the Law. Britain is great in its traditions of Song. The Hebrews are said to have made the Law of none effect by their traditions. Beware lest the law of Song, nobly held in the past by British singers, become degraded.

Traditional Music.

We may read that in the year 668, which is at least six hundred years before the date of the oldest MS. of music that exists (and it is British), Pope Vitalian sent singers into Kent to instruct the people in song. From the Venerable Bede

we learn that in 680 Pope Agatho sent John, Precentor of St. Peter's at Rome, to teach music to the monks of Wearmouth, and that he opened schools for that purpose in various parts of the kingdom of Northumbria. There is also a tradition that King Alfred in 866 founded a Professorship of Music at Oxford for the scientific cultivation of the art. We are told, too, that when Thomas a' Becket went to Paris in 1159, to negotiate the marriage between the eldest son of Henry II. and the daughter of Louis VII., he entered the French towns preceded by two hundred and fifty boys on foot in groups of six, ten, or more together, singing English songs, *according to the custom of their country.*

Authority for the Pride in British Song.

Is it to be wondered at, then, that in the light of this glorious past, our Education Department has recommended that these songs, some of which are undoubtedly the very ones recorded above, should be taught throughout the length and breadth of the land?

National Songs.

(E. A. T.)

CHAPTER XVII.

Historical Aspects of Mathematics.

THE historical side of this subject is well worth some preliminary attention. Our system of notation is so much a part of our lives that we are apt to forget that there was a time in the history of mankind when this beautiful notation was nonexistent, and, indeed, a time when the acquisition of the knowledge that one and one made two was "a distinct step forward."*

History of Mathematics.

One can readily imagine that some means of counting was a necessity in a very early stage of man's existence. What, then, could be more natural than the employment of the fingers for this purpose? This method of counting has given us our denary scale of number, and we see its influence in the word digit (Lat. *digitus*, a finger).

Difference between Savage and Civilised.

The next step was possibly the use of pebbles. The finger counting would sometimes become very inconvenient. When the use of such larger numbers created a demand for some method of counting, pebbles were used. We have this stage of arithmetic crystallised in the word calculation (Lat. *calculus*, a pebble). Indeed, this pebble calculation is still used; the abacus in China, Japan, and other countries is still the common method of reckoning.

* *The Story of Arithmetic.* Cunnington; Swan, Sonnenschein & Co.

The earliest known notation is perhaps that of the Phœnicians; their system consisted mainly of simple strokes, up to ten; eleven was a single stroke crossed through. The Egyptian notation, another very early one, was in hieroglyphics, and very cumbrous. The Babylonian notation was equally cumbrous, but is interesting because we owe to it our sexagesimal subdivisions of the hour and of the degree. Even the Greeks, with their wonderful achievements in mathematics, had no notation that allowed calculation to be done with any ease. Their earliest number signs were the initial letters of the names of the numbers. Later on, the letters of the Greek alphabet were used.

Notation.

A notation much better known to us is the Roman, with seven different signs, and evidently based on the hand method of counting. It is said that the Roman numeral V is a representation of the hand, with the fingers together and the thumb outstretched; X consists of two V's. This notation is far more convenient for representing numbers than any of its predecessors, but is not suited for calculations. This will readily be seen if a simple addition sum be attempted with the numbers written in Roman notation. One cannot but regard with admiration and respect the great advances in mathematical knowledge that were made in the face of the seemingly insuperable difficulties of early notation.

Our modern notation comes to us from the Hindus, through the Arabians. It first appeared in Europe in the twelfth century, but seems to have been known in Thibet long before that. The Moors introduced it into Spain, and in the thirteenth century it found its way into Italy. Its introduction into general use was slow; strange to say, attempts were even made to forbid its use, and nearly three centuries passed before it became at all common.

Debt of Civilisation to Hindus.

One triumph of this Hindu notation is the introduction of the cypher. The early Hindu mathematicians contented

themselves with leaving a space where there was no figure. The disadvantages of this are obvious, and the next step was to place a dot in this space. Dots, however, are elusive things, and it became customary to imprison this dot in a circle. Finally, the dot was omitted altogether, and the circle left.

Measurements.

The history of our various systems of measurements is most interesting, and might with advantage be touched upon in lessons bearing on these branches of arithmetic. The story of the money-table shows how, in the first place, money was merely a standard or measure of value; how, later, it came to be an equivalent as well; how gold and silver, from their portability, quality, and divisibility, were adopted as standards. The derivation of the word "pecuniary" might well be remarked upon. The word "sterling," too, has an interesting history. In the fourteenth century, German merchants, who were called Easterlings, used a coinage which, from its purity, was greatly in demand, and some of their countrymen came to England to bring our coinage to the same standard.

The grain is the basis of our methods of measuring length and mass. In the thirteenth century, the English penny was decreed to be of the weight of thirty-two wheat corns in the midst of the ear. Twenty of these pennies made the ounce, and twelve ounces the pound. The *avoirdupois* system had its origin in the common practice of using a heavier pound for articles such as wool, etc., but it was long before the two scales were definitely divided. Our hundredweight of 112 pounds has a most creditable origin. At first 100 pounds, it increased considerably in practice; our fathers never hesitated to give more than the weight demanded, and it became necessary to fix the hundredweight at its present figure. The modern avoirdupois pound of 7,000 grains, although ultimately based upon these old considerations is now determined with reference to the length of the seconds'

pendulum, and the gallon, the unit of capacity, is the volume of ten of these pounds of distilled water at a certain temperature.

Our measures of length show their origin in their names, the barleycorn, the nail, the foot, etc.; the span, pace, mile, etc., have their origin in certainly easily ascertained distances. These lengths have varied from time to time, as one would naturally expect. Various attempts were made to standardise the system, but it was not until the early nineteenth century that the schoolboy's bugbear, the "rod, pole, or perch," was defined to contain five and a half yards. The "perch" of Elizabeth's time contained six yards, the mile being "eight furlongs" (*i.e.*, furrow-longs) of forty perches each. When the length of the mile was reduced to 1,760 yards, the subdivisions were kept; hence the incongruity of the five-and-a-half yard "pole or perch."

In connection with the measurement of time, it should be noted that natural phenomena are the basis. Day and night naturally suggest some sort of a unit, and observation of the moon gave the month. Indeed, the very name "moon" means "measurer." The subdivision of the day into hours is of much later growth. Division into "watches" was one of the earliest methods adopted. The origin of the hour is unknown, but the sexagesimal division of the hour is probably Babylonian. The year, again, was fixed from observation of the sun; and it was very early seen that the lunar months did not quite fit in with the solar year. The division into weeks is quite artificial, and probably originates in the veneration attached to the number seven.

The whole story of the difficulties that had to be faced and overcome in the making of the calendar is most interesting. These difficulties arose from the fact that the natural units—the day, month, and year—do not fit in with one another, and most careful corrections have to be made to make our conventional units practicable.

Again, we are so apt to take such signs as +, −, =, as part of the nature of things, that it is well to bring to the minds of the pupils the fact that somebody had to think of these signs first. For instance, the old manuscripts used a dash, as we do sometimes, to signify the omission of a word; hence it conveyed the idea of lessening. The additional stroke in the "plus" sign implied the negation of the "minus" sign. The sign of equality was first used as a labour saver by the famous mathematician, Robert Recorde, in the sixteenth century. The signs : and :: were originally ÷ and =.

It is not suggested that this historical side shall be made a separate branch of the subject, but it may be introduced as opportunity arises. For instance, would not early lessons on measurement of length or mass gain greatly in interest if the class were told how these apparently incongruous measures came to be used? Would not a first lesson on decimals be improved by some reference to the book "Disme: the Art of Tenths or Decimall Arithmetike, teaching how to perform all Computations whatsoever by whole numbers without Fractions, by the Four Principles of Common Arithmetick, namely, Addition, Subtraction, Multiplication and Division. Invented by the Excellent Mathematician, Simon Stevinus. Published in English, with some additions, by Robert Norton, gentleman"?*

Geometry.

The Science of Geometry is naturally associated with the name of Euclid (*circa* 306-283 B.C.), who was a teacher at Alexandria. His name has been confused with that of Euclid of Megara, another philosopher, to whom has frequently been assigned, wrongly, the Euclidian system of Geometry.†

However, according to Aristotle, geometry was first studied in Egypt, and the Greek geometers owe a great debt to the

* *The Story of Arithmetic.* Cunnington.

† *E.g.*, "The Elements of Geomentrie of the most ancient philosopher Euclid of Megara, faithfully (now first) translated into the English toung by H. Billingsley, citizen of London, 1570."

Egyptians. Egyptian geometry was chiefly concerned with constructions; in method it was not logical, and the work was not sufficiently general. Greek geometry was conspicuous for its logical arrangement.

There are other men besides Euclid that are worthy of mention in connection with Greek geometry. Thales (640-546 B.C.) discovered several theorems. Pythagoras (580-500 B.C.) is remembered chiefly by his discovery of the relation between the sides of a right-angled triangle, but, among other things, he is said to have discovered the sum of the angles of a triangle. Archimedes (287-212 B.C.) is famous for his work on hydrostatics, especially for the discovery of his famous "principle"; the "Eureka" story still lives. The manner of his death is typical of the zeal of the Greek mathematicians. Absorbed in the study of his sand figures, he met his death as the result of a request to the soldiers who were attacking the town not to destroy his circles.

Three problems troubled the minds of the Greeks, as they have troubled generations of mathematicians since; the trisection of an angle, the squaring of the circle, and the duplication of the cube.

Euclidian geometry was not studied in Europe until the fifteenth century, and from that time until quite recently it has been the standard geometry. It must be remembered that a great deal of this work was not Euclid's own. He collected and arranged what was known at his time.

Something of Algebra was known to the Egyptians. In the Ahmes papyrus (1700 B.C.), simple equations are dealt with. The Greeks, too, did some algebra, although it strikes us as curious that they made no use of it in their geometry. It appears to be to the Hindus and Arabs that most credit is due for this branch. We know, for instance, that from the fifth to the seventh century A.D., the Hindus studied permutations and combinations, quadratics, square and cube root, trigonometry, and

Algebra.

even the solution of indeterminate equations of the form $y^2=ax^2+1$. The Hindus, too, were the first to treat of negative quantities as quantities in themselves. Strangely enough, the comparisons by which they sought to explain a negative quantity—possession and debt, direction of straight lines—are among those commonly used in our schools to-day.

Among the contributions of the Arabs to algebra were the solution of equations of the form $x^m+ax^n=b$, and the formulæ for the sum of the squares and cubes of the "natural" numbers.

There is something surprising, almost startling, in the extent of the knowledge of these men, belonging to races which we are inclined to despise, as inferior to ourselves; yet we owe them a great deal, in more ways, perhaps, than we can calculate.

The invention of the metric system by the French revolutionists, was, next to the discovery of logarithms by Napier, probably the greatest mathematical event of recent centuries. The selection of the unit (the *metre*) was dependent upon a determination of the earth's circumference which we now know to have been incorrect. The length of the metre, however, has been kept unaltered, although it is not exactly one ten-millionth part of the earth's quadrant, as intended. Roughly, an inch=2·54 cms., a metre=3 ft. 3¼ ins., a kilogram=2·2 lbs., a kilometre=5 furlongs. The breadth of a pin's head, of a finger-nail, and of a hand, are still rougher approximations to a millimetre, a centimetre, and a decimetre respectively.

The use of the Latin and Greek prefixes (deci, deka, etc.), and the derivation of the tables of mass and capacity from that of length, are matters of interest.

(W. J. S.)

CHAPTER XVIII.

The Teaching of Mathematics.

THE "three R's" for many a year held the chief, often the only, place in the curriculum of the elementary school. "No superstition dies harder," said a well known London head-master some time ago, "than that the main object of an elementary school is to teach the children to get four sums right and no mistakes in dictation." The shadow of those bad days is over us now!

It is not a little remarkable that a scheme of education which showed neither educational foresight nor enthusiasm, should lay such stress on arithmetic! One could have understood a scheme that was severely practical; but, strange to say, with a severely practical intention, the scheme was such that practical utility was the last charge that could be brought against it. Yet, unprofitable as it was, soul-killing as much of the teaching had to be, the framers of our elementary school code "builded better than they knew." At least, they recognised that arithmetic had its place in the education of the young.

Mathematics in Modern Life.

The reason that carried most weight was that of practical utility. Some ability to manipulate figures is a *sine qua non* to most people. Bills have to be added up, "change" has to be given, the cost of articles has to be calculated. Inability to perform these simple operations is a severe handicap.

Whatever weight this reason had in the educational dark ages of 1861 is multiplied a hundredfold now. Science possesses an influence undreamt of then; scientific method and scientific thought are exerting an ever-growing power over industrial processes; mathematics, "the indispensable handmaid of science" (Herbart), is an essential part of the technical equipment of the skilled mechanic. He must know how to find areas and volumes, to calculate weights given the volume and density, to construct and interpret a graph or a force diagram. In the whole range of skilled trades there are scarcely half a dozen which do not call for some mathematical knowledge.

Such knowledge, important as it is to the rank and file, is still more important to the leaders and pioneers of science and industry. The world owes a great debt to its mathematicians. The scientist, with a good mathematical equipment, can go far beyond the limits of experiment with little risk of error, and many a physicist has found to his cost that ignorance of this one science has been a barrier to his progress in research. It is not too much to say that science would not stand where it does to-day without the help of mathematics. Such little knowledge as we have of the structure of matter has been very largely supplied from mathematics; at the other end, as regards dimension, our knowledge of stellar and planetary motion comes from the same source. This involves no depreciation of the vast number of accurate and delicate experiments and observations that have been made; they are invaluable; but mathematics goes further, and makes use of experimental results to penetrate into regions where neither experiment nor observation is possible. Even the mysterious laws of heredity are now being tracked down by mathematical means.

The leaders in work of a more industrial type find this subject essential. The designing of bridges, ships, or machinery

requires advanced mathematical knowledge. Even such a problem as the artificial ventilation of buildings calls for similar aid.

Nor is it less necessary in commercial life. To be "quick at figures" has long been the cardinal virtue expected of a clerk.

Hence mathematics, regarded from a purely utilitarian standpoint, has so many applications in the life of to-day that it is well worthy of consideration as a school subject.

This subject, above all others, is exact. "Mathematical accuracy" has come to mean the greatest possible degree of accuracy. Ignorance cannot here be concealed in verbosity; two and two insist on making four. To work accurately calls for sustained effort and concentrated attention, and without these no degree of success in mathematics is possible. Of course, any subject worth studying at all calls for accuracy in some form or other, but that required in any mathematical work is of a different kind. That is why the study of number is so important. It calls for sustained effort and self-control; there is no room for shuffling or casuistry. In this respect mathematics is morally valuable.

The study also gives a training in accuracy—*in subjects where number is concerned.* It does not, for example, develop accuracy in judging men; Laplace was dismissed by Napoleon for incapacity.

As a scientific study, it introduces the pupil to methods of reasoning, more especially the deductive method. It is too much to say that it teaches a pupil to reason, for reasoning is a question of content,* but it does, at any rate, afford good examples of the *method* of deductive inference, of reasoning from general principles to particular cases. For example, when, in arithmetic, we say that if one yard of stuff costs sixpence, then five yards will cost five sixpences,

* Mill even says, in his *Autobiography*, "In mathematical processes none of the real difficulties of correct ratiocination occur."

we apply a general principle to a particular case, *i.e.*, we reason deductively.

The opposite process of inductive reasoning from particular cases to general principles, is not largely used in mathematics. Nevertheless, it has its place. Thus, suppose it is required to demonstrate to a class that the value of a fraction is not altered by multiplying or dividing the numerator and denominator by the same number. It can readily be shown on the black board that

$$\tfrac{1}{2}=\tfrac{4}{8}=\tfrac{2}{4}=\tfrac{8}{16},$$

$$\text{or, } \tfrac{2}{3}=\tfrac{4}{6}=\tfrac{8}{12}, \text{ etc.}$$

From these particular cases, provided we take a fair number of examples, we can state "inductively" the general principle

$$\frac{ma}{mb}=\frac{a}{b}.$$

It is to be noticed that the process of merely accumulating examples in this way has none of the certainty of a mathematical "proof," but in the class teaching of this subject many points arise which cannot be mathematically proved, owing to lack of the necessary knowledge on the part of the class. In such cases this use of "induction" needs no apology.

By a similar inductive method, experimental geometry gives many valuable results, *e.g.*, the formulæ for the circumference and area of a circle, and for the areas of rectangles and triangles, and many of the important geometrical theorems.*

Mathematics then, as a science, deals with the principles that underlie the art of computation. This scientific aspect is educationally very important. If the study of principles is neglected, mathematics can never form a valuable body of knowledge that will contribute as it might to the thought circle. The scientific basis *must* be emphasised in order to bring the knowledge into line with other studies. One who has studied this science as a science, has a weapon at hand

* It must be noted that another process, also known as "mathematical induction," is something entirely different.

that has many uses; one whose knowledge is empirical—who knows results without knowing how they are obtained, or the underlying law—is hopelessly out of his depth in anything outside the particular problems to which his formulæ are applicable.

To lay emphasis on this aspect of mathematical teaching implies no neglect of the subject as an art. There will be ample opportunity for practice in rapid and accurate computation, as well as in the use of labour-saving devices. On the other hand, if mathematics is taught as a series of clever dodges (obtained from goodness knows where) for the solution of puzzles, there is not much to be said for it as a school subject.

It happens not infrequently that a class will grasp the working of a rule without grasping the underlying principle. They understand quite clearly the letter that killeth, but the life-giving spirit is absent. This may easily occur, in spite of care on the teacher's part; whether it has happened or not can be tested only by the way in which examples are worked; if pupils are content to follow the rule blindly, without noticing where the work may be shortened by an appeal to a principle, there is something wanting in their knowledge.

For example, a boy had this sum to work: If a hundredweight of a substance cost 17s. 6d., what is the price per pound?

Instead of working this intelligently, and stating that one pound must cost $\frac{17\frac{1}{2}}{112}$ shillings, the sum was "stated" as follows:—

$$112 : 1 :: 17\tfrac{1}{2} : \text{Ans.}$$

$$\therefore \quad \text{Ans.} = \frac{17\frac{1}{2} \times 1}{112}.$$

The answer is, of course, correct, but the method is a flagrant example of the unintelligent use of a "rule" in the wrong

place. Such a method shows that the underlying principles were not fully understood.

Again, sums like :—

$$\tfrac{3}{4}+\tfrac{3}{10}-\tfrac{1}{5}+\tfrac{1}{8}+\tfrac{7}{100}$$

are nearly always solved by finding the L.C.M. of 4, 10, 5, 8, and 100; whereas the $\frac{3}{4}$ and $\frac{1}{8}$ might be treated mentally ($=\frac{7}{8}$), and also the $\frac{3}{10}$, $\frac{1}{5}$, and $\frac{7}{100}$ ($=\frac{17}{100}$); and then the two fractions $\frac{7}{8}$ and $\frac{17}{100}$. There is not enough recognition of the kinship of fractions. In fact, the greatest need in present day arithmetical teaching is *common sense.*

It must be admitted that this subject is not one which arouses naturally any great interest or enthusiasm in its earlier stages. Yet interest is the life of successful work, and it must be supplied somehow. How can the teacher of mathematics arouse this interest?

In the first place, care must be taken to see that the successive steps of the work are understood. Failure to grasp any step means bewilderment in all subsequent work, and bewilderment breeds dislike. On the other hand, the acquisition of a new piece of knowledge is usually a keen delight, even to the most hardened cynic of thirteen or fourteen; in mathematics, more readily than in most subjects, this knowledge is put to the test.

Then the teacher's own interest and influence carry much weight. He must be keen on his work, and able to impress some of that keenness on his class. He must "make the pupil ashamed of being scared at fractions, of being 'downed' by the law of falling bodies; rouse his pugnacity and pride, and he will rush at the difficult places with a sort of inner wrath at himself, that is one of his best moral faculties."*

One essential thing is to make the work bear, as far as possible, on everyday life and on the rest of the curriculum, and to take full advantage of practical methods.

* James' *Talks to Teachers.*

This statement at first sight suggests the ideals of the educational Philistine, who values "education" in proportion as it enables its recipient to earn more than his neighbours. In reality it is nothing of the kind. Our great error in the past has been to detach the school from daily life; our work has suffered, both in results and in public esteem, from this. Probably as much "mental training" is possible in connection with practical problems that awaken personal interest as in connection with purely fanciful or academic problems.

This is not the place for a digression as to what is implied by bringing education into relation with daily life. It will be sufficient to say that it most emphatically does not imply any social distinctions. It does not mean, for example, that because a boy is the son of a farm labourer, he is to be taught only such things as will "keep him in his proper station." It means that the subject will gain greatly in its interest and usefulness by the teacher utilising its connections with the environment and with other subjects; and its connections are many.

Correlation.

Its relation to science has been seen before, and the teacher can make great use of it in his work.

It is impossible to give in any detail all the parts of science which may be utilised for mathematical work. A few suggestions must suffice:—

Levers as illustrating inverse proportion.

Specific gravities and densities; Principle of Archimedes and its applications; calculations of weights of materials.

Expansions: the expansions of gases; Boyle's and Gay Lussac's Laws (inverse and direct proportion).

Increase of weight on burning solid in air; composition of air; speed of sound; problems on ventilation, etc.

These points alone will provide a wide field for examples of various mathematical rules.

A great deal of what is commonly taken in science courses may well be taken in arithmetic; such things, for example,

as the measurement of more definite areas and volumes may be done by the class as part of their arithmetic work.

Again, the enormous fertility of certain insects, the annual damage done by such creatures as the clothes moth, and the rate of growth of plants, are matters that suggest the application of arithmetic to nature study.

Finance and Citizenship.

National and municipal finance is another valuable source of material. Most of us are honoured at painfully frequent intervals with various "demand" notes. Even these may be turned to good account, and utilised, not only to convey to our pupils what is meant by "assessment," "ratable value," but to give them an intelligent idea of how a municipality or a county raises the money necessary for public work. We may even do something to dissipate the atmosphere of mystery that surrounds an income tax schedule.

Geography.

Geography, too, may be utilised for the same purpose. Many arithmetic lessons may be spent over the pages of the geography text-book. Densities of population may be calculated; ratios of areas, or the percentage that the annual value of one product is of another, may be found. Problems like the following may be set: Mount Lebanon or Lake Baikal is so many feet above sea-level; the Dead Sea is so many feet below sea-level; what is the difference in level between Mount Lebanon or Lake Baikal and the Dead Sea? The position of almost all the towns of England could be learnt in the arithmetic lesson, through calculations of distance, time, and railway fares.

Physical geography, which closely touches on science, gives valuable mathematical work, which will bring home the working of natural processes in a very striking way. For example, the class knows that river water contains a small percentage of dissolved solid. Give them the sectional area of the river bed and its rate of flow, and let them calculate how much solid is carried down in, say, a week. The results

will certainly impress them with the great effect that the action of water has on the land.

Household Matters.

The affairs of the household may well claim a share of attention. Lack of acquaintance with the mathematical aspect of life is responsible for a great deal of improvidence and thriftlessness. The making of a weekly or monthly budget for household purposes is a most useful plan. A class can be taught to prepare estimates for cost of living, or cost of electric light or gas; or they can find what they will have to spend to buy sufficient wood to make a bookcase. Similar examples will suggest themselves. Problems bearing on the work of savings banks, insurance offices, and building societies are very useful.

It is not contended that the use of these and similar examples will at once produce a keen enthusiasm on the part of the learner, but it will show, at least, that mathematics is not something very much in the clouds—not a subject which has to be studied merely because unreasonable schoolmasters demand it, but one that ramifies through many departments of life. The subject will be better "apperceived," better fitted into the child's circle of thought, in this way than in any other.

It must be noted that it is not always possible to find at once an application of a rule to such problems. Some of the work, for the sake of practice and of clearness, must deal with number *pure and simple.*

Practical.

Practical measurement will do much to keep up interest in the study. These practical methods ("paper folding and cutting") have been used for years in the Kindergarten stage, but it is only recently that they have been permitted to overflow into more advanced work, and yet they are at least as useful in later stages.

Where it is possible, the pupils should be allowed to measure areas and volumes for themselves. To suggest that they should

also weigh is a counsel of perfection, but if it is any way possible, it should be done. Squared paper should be constantly in use for the measurement of areas and for plotting graphs. Senior standards might with advantage measure the area of the school playground or class-room, the window-panes, the floor blocks, etc., where such a thing can be carried out without interference with school discipline. There can be no question that boys like this graphical and practical work. Something like a complete mathematical survey of the school could be undertaken. A little judicious hint will often set boys at work keeping a graph of their marks, or of the class attendance. Indeed, a boy has been known to keep a graph of the weight of his kitten at home!

Much of this practical work has hitherto found a place in the science syllabus, but it is far better suited for the mathematical lessons. It leaves the science master free to attend to natural phenomena, and it helps the teacher of mathematics by bringing his subject down to earth.

Here the voice of the objector is heard complaining: "A plague on your practical mathematics! This advanced Kindergarten is another dodge to peptonise education—to make it that soft and agreeable process that is slowly robbing our boys and girls of all moral stamina. No, sir, give them plenty of hard work; they have to face drudgery in life; let them begin at school, and send back your 'Made in Germany' educational theories to their birth place!"

To such objectors there are two answers: that no one ever did good work in any subject in which he was not interested; and that interest in a subject will not abolish drudgery. What interest does is to make drudgery bearable.* The teacher of arithmetic who interprets the Herbartian doctrine of interest to mean that no hard examples are ever to be given to a class is making a dangerous error.

* "The theory of interest does not propose to abolish drudgery, but only to make drudgery tolerable by giving it a meaning."—ADAMS, *Herbartian Psychology*.

The mathematics of the elementary school consists largely of arithmetic and geometry. Algebra, as a separate subject, is not very commonly taught; yet it would be a great pity if algebraic methods were totally neglected. For example, there does not seem any essential difficulty in bridging over the gap between adding six apples and eleven apples, and performing the same operation with 6 x and 11 x. Questions in proportion, and many other problems, may very well be worked in equation form. Not many years ago the idea of introducing algebraic methods in arithmetic or geometry was regarded as a pestilent heresy; an "x" in an arithmetic paper was unpardonable. A certain headmaster, whose sense of humour seems to have been greater than his respect for tradition, salved his conscience by using "a" or "b" instead! It is to be hoped that we have now passed that stage, for the use of the equation in many problems gives a solution far more elegant than is possible otherwise.

Algebra.

It is not suggested that algebra can be taught as a by-product of arithmetic; it is suggested that enough may be done to give familiarity with generalised methods. In order to attain this, it must be noted that the meaning and use of the signs, $+$, $-$, $\times$, $\div$, must be thoroughly understood, and plenty of practice given in their use; especially the function of the double minus sign, as in $-(-4)$, should be elucidated by the analogy of cancelled debt, or by a graphic method.

Oral work, commonly called "mental," forms an indispensable part of arithmetic, but it must be *real* mental arithmetic, not the shoddy variety that too often passes for the real thing. The aim in this branch should be to help the written work. Years ago, more frequently than at present, mental arithmetic stopped at the teaching of a series of dodges, *e.g.*, "to find the price of a score of articles, call the shillings pounds;

Mental Work.

to find the price of a dozen, call the pence shillings." Of course, there is nothing wrong in teaching these devices; the mistake is to neglect other less showy but more useful work. The following are some useful exercises :—

1. Start with a certain number, and let each pupil add another number to it; *e.g.*, start with 2, and add 7; the successive results will be 9, 16, 23, etc.

Similar exercises may be done in subtraction, and money may be substituted for the pure numbers.

2. Multiplication at sight, *e.g.*, 38×65.

$$(30+8)(60+5) = 1800+8\times60+5\times30+40$$
$$= 1800+630+40,$$

by the ordinary algebraical method.

Hence, the units figure is obtained from $8\times5=40$, **0**, and 4 over.

Tens $4+8\times6+5\times3=67$, **7**, and 6 over.

Hundreds $6+3\times6=$ **24**.

Hence, result $=2470$.

The method may be extended to three figures.*

These results would generally involve some writing, although the work is mental, and one may here remark that mental and written arithmetic are too often separated from each other instead of affording mutual support.

3. The addition and subtraction of two fractions, *e.g.*:—

$$\tfrac{1}{2}+\tfrac{1}{5}=\tfrac{7}{10}, \quad \tfrac{3}{7}+\tfrac{5}{8}=\tfrac{59}{56}.$$

A ready device, which can be used in moderation, is to multiply crosswise 3 by 8 and 7 by 5, ignoring the usual L.C.M. method; very quick work is thus possible.

4. Simple questions in percentages, *e.g.* :—

What is 5%, 15%, $12\frac{1}{2}$%, etc., of £2?

5. Easy examples in ratio and proportion, *e.g.*, the ratio of a shilling to half-a-crown, an ounce to a pound, etc.;

* Bryan, *School World*, Aug., 1907.

to find a number that bears the same ratio to 3 as 8 does to 4, etc.

6. Decimalisation of money at sight:—

2s. = ·1 of a sovereign.
1s. = ·05 „ „
6d. = ·025 „ „
¼d. = ·001 „ „

With a little practice an average class (age thirteen to fifteen) becomes very expert at this.

7. Application of rough checks, *e.g.*, the fraction $\frac{123}{381}\frac{25}{78}$ is, roughly, equal to $\frac{1}{3}$.

Earliest Stages.

The early stages of arithmetical teaching are generally found to give much difficulty. Opinions vary as to the methods to be adopted, but on one point there is unanimity; concrete methods must be used. The children must learn to count with objects of some kind, such as counters or strips of wood. It has been suggested that it is preferable to use objects which can be placed together to form a continuous whole; for example, the original ball-frame, we are told, should be made up of a number of cubes instead of the ordinary balls.* It is claimed that attention to this point will give a truer notion of a unit as part of a whole used to measure the whole. Whether such a consideration is necessary is, perhaps, open to question. In any case, the children must have something that they can see and handle.

It is a good plan to confine the earliest lessons to numbers, say, up to five. One caution is necessary in teaching to count. Children are very apt to confuse cardinals and ordinals. For instance, a child that has been taught to count objects synthetically, by building up groups from the unit, is likely to pick out the second of two things when asked to pick out two. This can be remedied by working analytically, that

* *Principles and Methods of Teaching.* Welton.

is, teaching any particular number by starting with groups containing that number of objects.

While the children are learning to count up to five, they should learn to analyse the numbers by arranging their counters in different ways, *e.g.*, five counters can be arranged as four and one, three and two, etc.

When 10 is reached, the nature of place value must be taught. By means of the ball-frame, bundles of 10 sticks, etc., this difficulty can be got over, and the meaning of a number like 15 explained. By the use of the same apparatus, the process of addition, say of 8 to 7, or of subtraction, *e.g.*, of 7 from 16, can be made clear. Written figures would be learnt at the same time, and the operations performed with the counters or sticks translated into these figures.

In dealing with the numbers from 10 to 100, the meaning of the suffixes "teen" and "ty" must be made clear. It is very useful to go through an exercise such as the following: Show 4 on the ball-frame, or let the children pick out four sticks or counters; write the number on the board; then add to it 10; ask the children how many this makes, and write it on the blackboard; continue this process of adding 10, and obtain the numbers 24, 34, etc. In this way show the children that the addition of 10 alters only the left hand, or "tens," digit.

At this stage also, the first acquaintance with multiplication will be made, and, *pari passu*, with division. Multiplication should be introduced as a shortened form of addition, and division as shortened subtraction, although the latter is not as easy to see as the former. By means of dots or counters, the fact that $3\times4=4\times3$ can be made clear, and the same fact can be shown when the class is massed for drill. The multiplication table may be partly built up now. It is good to join with each product the corresponding division, *e.g.*, $5\times3=15$; there are three fives, or five threes, in fifteen.

There are other points which should receive attention in these early stages; a few of the more important may be mentioned.

The practice of addition *by counting* should not be allowed beyond the very earliest stages. To avoid it, ample practice must be given in "grouping" numbers, *e.g.*, in pairs. After a time the children will be able to count up the even or odd numbers easily. Counting by fives is not difficult.

Children should have frequent drill in the components of ten, from the points of view of addition and subtraction. Counting by tens is an exceedingly useful method of addition. Indeed, for long "tots" it is by far the most satisfactory way. Thus in adding 8 and 5, the 8 is first made up to 10 by taking 2 from the 5, and the 3 remaining gives the result 13. This method is also useful in subtraction, *e.g.*, in subtracting 7 from 15, first take the 7 from 10, and add the remainder 3 to the 5. These points will, of course, first be dealt with concretely.

Written Work.

In most cases written work should follow immediately the concrete methods. The written sign should be learnt in connection with the group of counters, sticks, or whatever is used. In the early stages of the teaching of place value, the blackboard, divided into compartments for tens and units, should be used, and the children asked to write given numbers on it and on their books or slates. A third compartment for hundreds can in time be added. When the processes are thoroughly grasped, the compartments may be replaced by vertical columns, headed H, T, U. When the children can write down any given number of three figures, but not before, the thousands place may be introduced. Many teachers recommend that the three columns for thousands, *i.e.*, up to hundreds of thousands, should be introduced simultaneously, and provided that the writing of numbers up to 999 is thoroughly grasped, this plan should not present great difficulty, and it has the advantage of saving time. Copious prac-

tice is necessary, and it is useful to allow the children to decompose numbers, *e.g.*,—

$$27{,}658 \left\{ \begin{array}{r} 20{,}000 \\ 7{,}000 \\ 600 \\ 50 \\ 8 \end{array} \right.$$

These early stages are not easy. They must not be hurried, for a good grip of them is essential to future success. Continual practice is required, and the teacher should try, by means of games, to prevent this practice from becoming tedious. For example, a child is given five sticks, and told to hide some of them; he holds up the remainder of the sticks, and the other children tell him how many are hidden. Other occupations and games will suggest themselves, including the favourite "keeping shop," "counters" being used in place of coins.

Grube's Method.

The essence of Grube's method is the analysis of each number with reference to the preceding ones. Up to ten, each number is compared in this way with all those that precede; from ten to a hundred, only with the numbers one to ten. For example, here is the method of "measuring" the number 4 with 3:—

$$\left\{ \begin{array}{l} 3+1=4,\ 1+3=4. \\ 4-1=3,\ 4-3=1. \\ 1\times 3+1=4,. \\ 4\div 3=1 \text{ (remainder).} \end{array} \right.$$

Concrete illustration is used throughout, and copious practice given in the manipulation of the numbers. The results are applied to simple sums dealing with marbles, apples, etc. Grube would spend a year on the numbers 1 to 10, giving about two hours a week to the subject. For early stages of teaching this method has much to recommend it.

Subtraction.

There are two chief methods by which subtraction is taught —the method of "decomposition," and the method of "equal additions." These may be illustrated by examples. Suppose the sum set is to subtract 277 from 456.

$$\begin{array}{r} 456 = 300 + 140 + 16 \\ 277 = 200 + \ 70 + \ 7 \\ \hline 100 + \ 70 + \ 9 \end{array}$$

This method would be taken first with examples in which each figure of the lower line is less than the corresponding figure above. When the children can understand its working in such cases—they should at first be allowed to write the decomposed numbers—then the method can be applied to examples such as the one given. It is impossible to take 7 from 6; 50 is accordingly analysed into 40 and 10; the 10 is written above the 6 (*not added to it*), the 7 taken from the 10, and the 3 added to the 6.

This "decomposition" plan certainly presents one difficulty —the treatment of cyphers; for example: take 6237 from 50008.

The way to deal with this is to begin with a single cypher, and show, concretely, that the decomposition results in a nine appearing in place of the cypher. If this is then extended to two cyphers, further extension will be easy.

Consider now the example given above as treated by the method of equal additions :—

$$\begin{array}{rr} \text{Instead of } 456, \text{ we write} & 400 + 150 + 16 \\ \text{and} \quad \text{,,} \quad \text{,,} \quad 277 \quad \text{,,} & 300 + \ 80 + \ 7 \\ \hline & 100 + \ 70 + \ 9 \end{array}$$

In the top line 10 has been added to the right-hand figure, and 100 to the next figure. Therefore the same numbers are added to the bottom line in order to keep the difference the same.

Hence in this method we are really, as many writers have pointed out, substituting another sum for the one set. That fact, added to the fact that the principle is assumed that equal additions to two numbers does not affect their difference, rather suggest that the other method is preferable. The advantage of this method is that no difficulty arises with cyphers.

Logically, the decomposition method is certainly the better. However, it is not of essential importance that one method should be adopted rather than the other, provided the child understands what he is doing. In any case the process must in time become mechanical.

The method of complementary addition is probably inadvisable as a method of teaching subtraction, but it is so useful in connection with the Italian method of division that it should be taught afterwards.

Multiplication.

Multiplication should be approached through addition. Already the children will have some knowledge of multiplication. In earlier stages they will have built up a great part of the tables. These must be completed up to 12×12, and *must be thoroughly memorised*. A good case, indeed, can be made out for memorising tables up to 19 times, inclusive.

Consider the multiplication of 728 by 4. This should be written first as an addition sum:—

728	
728	
728	728
728	4
2912	2912

It is not difficult to make clear to children, by comparing the addition method with the multiplication, how the result is obtained, and they will certainly appreciate the saving of time and labour.

Where the multiplier has several digits, it should be decomposed, *e.g.*:—

$$
\begin{array}{r}
7264 \times 834 \\
800 \text{ times } 7264 = 5811200 \\
30 \text{ times } 7264 = 217920 \\
4 \text{ times } 7264 = 29056 \\
\hline
\text{Altogether } 834 \text{ times } 7264 = 6058176
\end{array}
$$

The step from this to the shortened form is not difficult:

$$
\begin{array}{r}
7264 \\
834 \\
\hline
5811200 \\
217920 \\
29056 \\
\hline
6058176
\end{array}
$$

The cyphers may be omitted as soon as the class can grasp the fact that each line begins one place to the right of the line above. This plan of beginning with the digit of highest place value in the multiplier has much to recommend it, because it is so useful in later stages, for approximation, that it is really better to teach it throughout. The universal neglect of this method is amazing. The only point wherein it suffers in comparison with the older method is in dealing with cyphers in the multiplier, but the difficulty is not a hard one to conquer.

Multiplication by factors should also be taught. That the same result is obtained as by direct multiplication can be found by actual experiment, and be demonstrated by a diagram on the blackboard.

Division is, in a way, a shortened form of subtraction.

The process of division ("measuring," see below) consists in finding how many times one quantity can be subtracted from another; in other words, how many times one quantity contains another. This view gives a useful method of approach.

Short division is commonly taught *viâ* long division. This certainly conduces to clearness, but when one remembers the

very common fault of dividing by long division where short division is better, one has doubts. The following scheme may be suggested for an early lesson on division :—

$42856 \div 8.$

$$
\begin{array}{r|l}
8 & 42856 \\
\hline
 & 40000 \\
\hline
 & 2856 \\
 & 2400 \\
\hline
 & 456 \\
 & 400 \\
\hline
 & 56 \\
 & 56 \\
\hline
 & \cdot\cdot \\
 & = \\
\end{array}
\qquad (5000+300+50+7
$$

$$
\begin{array}{rl}
5000 \times 8 = & 40000 \\
300 \times 8 = & 2400 \\
50 \times 8 = & 400 \\
7 \times 8 = & 56 \\
\hline
5357 \times 8 = & 42856
\end{array}
$$

When this process is clear, the shortened form can be written down as well. It is probably better to put in the cyphers first.

If this is understood, long division should not give great difficulty.

Division by factors is useful, but the way of finding the remainder requires care. Suppose the example is :—

$537562 \div 28.$

$28 = 4 \times 7.$

$$
\begin{array}{r|l}
7 & 537562 \\
\hline
4 & 76794 \text{ with 4 units over.} \\
\hline
 & 19198 \text{ with 2 groups of 7 over.}
\end{array}
$$

The remainder therefore is $2 \times 7 + 4 = 18$.

This may also be illustrated by a diagram.

The nature of the remainder should be taught; its expression as a fraction may be left until some knowledge of fractions has been acquired. The answer to a division sum must never be given, as, say, $2685+3$, where the 3 is the remainder. This is obviously wrong, but very common.

Acquaintance with the criteria of divisibility is extremely useful. A number is divisible by 2 if its last digit is even; by 3 if the sum of the digits is divisible by 3; by 4 if the last two figures are divisible by 4, or are cyphers; by 8 if

the last three figures are divisible by 8, or are cyphers; by 9 if the sum of the digits is divisible by 9; by 11 if the difference between the sum of the odd and even digits is zero, or a multiple of 11.

Measuring and Sharing.

A distinction of great importance, which is, nevertheless, frequently neglected, is that between "measuring" and "sharing." For example, consider the sums: (1) Eight shillings is to be divided equally among 4 people. How much will each have? (2) How many times is 4 shillings contained in 8 shillings?

The first example is one of *sharing*, the second one of *measuring*. The process of sharing involves a knowledge of fractions, and should be postponed until an elementary knowledge of vulgar fractions has been given. Early lessons in division should be confined to measuring—to finding how many times one quantity is contained in another. The answer to a *sharing* sum is concrete, to a *measuring* sum abstract (number of *times*). When a fraction is divided by another, measuring alone is possible, and the answer must be in *times*.

Italian Method.

The method of division known as the Italian, or Continental, method has been unaccountably neglected in England. It requires practice before certainty and accuracy can be attained, and for that reason, perhaps, should not be taught until some time after the elementary rules have been passed. It is, however, so neat and elegant that it well repays practice.

It may best be illustrated by an example:—

386258÷763.

$$\begin{array}{r|l} 763 & 386258 \;(\; 506 \\ & \underline{4758} \\ & \quad 180 \end{array}$$

Obtain the first figure of the quotient in the usual way. Then mental work proceeds thus:—Five threes are fifteen and

7 are 22; five sixes are thirty and 2 are thirty-two and 4 are thirty-six; five sevens are thirty-five and 3 are thirty-eight. The net result written down is the number 47. The succeeding steps are similar.

To teach this method properly requires vigilance on the part of the teacher to ensure that the pupils really do use the shortened method; otherwise they are very likely to present a result which looks very nice, until investigation shows that ordinary long division has been performed somewhere, and the shortened result written down.

Vulgar Fractions.

In the first stages of vulgar fractions, concrete illustrations must be used, and for this purpose some measure of length is most useful to start with, or, perhaps, of area, as giving results more striking to the eye. A very good method is to provide, or let the class make and cut out, paper squares of about three or four inches side. By folding these, the children can be made to understand the nature of a fraction as the result of sharing. They can also ascertain elementary facts concerning fractions from their figures, *e.g.*, that $\frac{1}{2}+\frac{1}{2}=1$; $\frac{1}{4}+\frac{1}{4}=\frac{1}{2}$; $\frac{3}{4}=\frac{6}{8}=\frac{9}{12}$, etc.

Easy cases of multiplication and division of fractions can be manipulated by means of these diagrams, and simple oral questions asked bearing on them. The division of vulgar fractions, a difficult point to explain (see above), can be overcome by means of these diagrams, and the rule of inverting the fraction and multiplying, obtained by experiment. Other concrete illustrations should be used; the fractions of the yard and foot; the aliquot parts of a sovereign, etc.

A great deal of oral work must be done in this, as, indeed, in every case of teaching new rules. Questions such as the following may be asked:—How much is $\frac{1}{2}$ of 2″; $\frac{1}{2}$ of twopence? how many halfpence in sixpence? how many farthings in a penny? the value of $\frac{1}{4}+\frac{1}{4}+\frac{1}{4}$; of $\frac{1}{4}''+\frac{1}{4}''+\frac{1}{4}''$; of $\frac{1}{2}$d.$+\frac{1}{4}$d.; of $1\frac{1}{2}''+1\frac{3}{8}''$ (this may be done by actual measurement, and the

results compared). Many other simple sums will suggest themselves.

Before long the necessity will appear, in order to add fractions, of bringing them to the same denominator, and also of being able to reduce a fraction to its lowest denominator.

This seems to be the most convenient place for introducing the study of Highest Common Factor and Lowest Common Multiple. It will be necessary to explain the meaning of a prime factor, and H.C.F.'s or L.C.M.'s should be found by reducing the numbers to their prime factors. It is very rarely, in the early stages, and certainly rarely in practical measurements, that any numbers will occur which necessitate the use of the long method of finding the H.C.F. The value of this method is largely academic, and the teaching of it may well be postponed, or at least treated as an exceptional device only to be used when more rational methods fail. Its explanation is too remote to be given.

In adding vulgar fractions, it is preferable for some time to make the children write down *each fraction* over the common denominator, *e.g.*:—

$$\tfrac{1}{6}+\tfrac{2}{9}+\tfrac{5}{18}$$
$$=\tfrac{3}{18}+\tfrac{4}{18}+\tfrac{5}{18},$$

instead of writing thus:—

$$\tfrac{1}{6}+\tfrac{2}{9}+\tfrac{5}{18}$$
$$=\frac{3+4+5}{18}.$$

The former method better ensures proper understanding of what is being done than the latter. When the method is thoroughly grasped, there is no objection to the "long-line" plan.

The function of the parenthesis in vulgar fractions may be taught by a comparison of examples such as the following:—

$$\tfrac{1}{6}+\tfrac{1}{3}\times\tfrac{1}{2}+\tfrac{1}{6} \text{ and } (\tfrac{1}{6}+\tfrac{1}{3})\times(\tfrac{1}{2}+\tfrac{1}{6}).$$

Weights and Measures Reduction.

Many of the common weights and measures will be taught as concrete illustrations in early stages, but these will want amplifying. There is no need to harass the pupil with some of the anomalies of English measurement, *e.g.*, the firkin, kilderkin, apothecaries' measure, etc. These are quite useless in ordinary life. There should be apparatus to illustrate the units. A balance and weights, rules of various lengths, and measures of capacity, are exceedingly useful. Some explanation may be given as to the choice of units, *e.g.*, why a boy's height is measured in feet, and distance along a road in miles; why a rule or a tape is used to measure length, and a hollow vessel to measure capacity, and so on.

The anomalous $5\frac{1}{2}$ yard, "rod, pole or perch," is apt to give trouble in reductions, but if the elementary principles of vulgar fractions are understood, the difficulty is greatly lessened.

Care must be taken that the children really understand each step as they proceed. For example it must be made clear to them why if 3 shillings is multiplied by 12, the result is 36 shillings, and yet, when the same operation is performed to bring the sum to pence, the result is 36 pence.

Another difficulty which is apt at times to try the teacher's patience is that many children experience great trouble in deciding whether they have to divide or multiply at any particular step in reduction. The point is apt to arise most unexpectedly. The great remedy is to be found in copious oral work.

The change from long measure to square measure should be made by means of diagrams, so that the pupils can construct the table for themselves, as far as the "square pole." The rood and acre, being new terms, will have to be explained. Similarly by means of diagrams, the transition to cubic measure can be made. With these it will be well to take easy cases of measurement of area—the square, rectangle, triangle, for example. Squared paper will be found most useful here.

Areas can be found by counting the squares, and if the arithmetical work be co-ordinated with geometry, the relations between parallelograms, rectangles and triangles of the same base and height can be investigated experimentally. Simple cases of volume measurement also might be taken in connection with cubic measure, and applied examples given involving area and volume

Decimals.

As soon as the meaning of a fraction is understood, decimals may be introduced. The best way to do this is to work from the known facts of place value. Remembering that the value of any digit in a number is one tenth of what that digit would have in the next place to the left, a class should not have great difficulty in grasping that the place next to the right of the units figure should represent tenths, the next hundredths, and so on. This method of approach seems far more logical and satisfactory than any other method. The history and significance of the point may be dealt with here also.

As soon as the general idea has been explained, practice should be given in converting decimals into vulgar fractions. Some of these should be committed to memory, *e.g.* :—

$$\cdot 5 = \tfrac{1}{2},\ \cdot 25 = \tfrac{1}{4},\ \cdot 125 = \tfrac{1}{8},\ \cdot 6 = \tfrac{3}{5},\ \text{etc.}$$

Addition and subtraction with decimals give no trouble. In multiplication the pointing presents difficulty. In the first place, the effect on the decimal place of multiplying by a unit, by ten, by a hundred, should be tried. Probably the easiest method is through the medium of vulgar fractions, and the rule for pointing in the multiplication of decimals can be found in this way. Thus, $35 \cdot 1 \times \cdot 06 = \frac{351}{10} \times \frac{6}{100}$; consequently there must be three decimal places in the answer; the 351 and the 6 may be multiplied with no reference to the place value of their digits. Yet in view of the teaching of approximate methods later on, one would be inclined to suggest that the pupils should have practice in pointing

each line as they proceed, beginning to multiply with the digit of highest value in the multiplier. This is by no means easy, and may be conveniently postponed until greater proficiency has been attained.

The teaching of division of decimals is very difficult. It is, perhaps, best to begin by bringing vulgar fractions to decimals. Take, for example, $\frac{1}{5}$, the decimal equivalent of which is known. We cannot divide the five into the one, but if we call the one ten tenths, we can share it by 5, and obtain 2 tenths, or ·2. Next try $\frac{1}{4}$. Dividing the unit into tenths as before, we obtain 2 tenths and 2 tenths over. This remaining 2 tenths may be shared by 4 by calling it 20 hundredths, giving as a result 2 tenths and 5 hundredths, or ·25.

$$\frac{1}{4}=\frac{10 \text{ tenths}}{4}=2 \text{ tenths}+\frac{2 \text{ tenths}}{4}=2 \text{ tenths}+\frac{20 \text{ hundredths}}{4}$$
$$=2 \text{ tenths}+5 \text{ hundredths}$$
$$=\cdot 25.$$

A few examples of this kind, some being improper fractions, should be enough to make the method clear.

Opinions differ as to the best method of teaching to divide one decimal by another; one way is to multiply dividend and divisor by a power of ten sufficient to leave the divisor a whole number, another is to multiply by a power of ten sufficient to leave both terms free from decimals. It is almost a counsel of perfection to suggest doing without either plan, and dividing straight away, reasoning from first principles as to the position of the decimal point in the quotient. This can, and should, be done in many cases, especially where the divisor and dividend both contain whole numbers, and the divisor is the smaller, but in other cases some other method must be adopted.

The effect of division by any power of ten on the position of the point must be made clear.

Children are sometimes taught to ignore the place value till the end of the division, and then locate the decimal point

by following the inverse of the method illustrated above, in the case of multiplication. This is, perhaps, allowable, if the principle is really understood; otherwise it is not.

Recurring decimals are really hardly of sufficient importance to engross much time. The adequate discussion of them belongs to a later stage, and it is questionable whether more need be done here than deal with the common recurring decimals, such as those with denominator 3, 7, 9, 11.

Considerable practice should be given in bringing concrete quantities to decimals of a particular unit. The decimalisation of money at sight is particularly useful, and has been already mentioned. The metric system would naturally be dealt with in connection with this.

A good knowledge of decimals is of such advantage that considerable time should be given to their study. Pupils should be encouraged to work in decimals wherever possible. Two cautions, however, are necessary. There are cases in which vulgar fractions are simpler, and therefore there is a danger in making a fetish of a particular method. Secondly, the use of decimals in practical work generally implies a certain amount of approximation, and young pupils are very prone to save themselves trouble by over approximating, though at present the opposite tendency prevails, and they do not approximate enough.

Percentages.

In dealing with percentages, it must be made clear that a percentage is actually a fraction with denominator one hundred, although the denominator is implied and not expressed. If this is made clear, there is very little to give trouble in this branch of arithmetic. Indeed, the only other difficulty is the ambiguity with which examples are worded; in sums, for example, on gain or loss per cent., it is frequently difficult to know whether the "per cent." is on the sale or cost price. Certainly, as a matter of common sense, one would be inclined to express gain or loss as a percentage of the

outlay, but very commonly in business it is expressed as a percentage of the returns.

The pupils should be made familiar with the fractional equivalents of the more common percentages, *e.g.*, $2\frac{1}{2}$, 5, $7\frac{1}{2}$, $12\frac{1}{2}$, etc. In finding percentages of sums of money it is generally best to decimalise both the percentage and the sum, and multiply straight away.

Ratio and Proportion.

The nature of ratio may very well be explained in connection with vulgar fractions. It must be made quite clear that a ratio can exist only between quantities *of the same kind.* The pupils must be familiarised with the idea by copious and varied examples. Drawing affords many. The ratio of the height of a cone to its length may be expressed numerically before the class proceeds to draw the cone.

One is on thorny ground in dealing with proportion. Probably there is no branch of arithmetic which has produced so much unintelligent working as this. The "Rule of Three," with its accompanying dots, has certain advantages, but its use has been such that one cannot be surprised that the Board of Education, in its *Suggestions*, advises the abolition of the rule altogether, as "an obstacle to clear thinking and an offence against the common sense of the child." The Rule of Three, by the way, should be the Rule of Four.

The method of unity does not seem to involve any conscious idea of proportion, but it is perhaps the best way of beginning this branch of arithmetic. It would be a mistake, however, to confine the teaching to the unitary method. There is a tendency to do this in reaction from the mechanical use of the Rule of Three. The unitary method has the merit of being easy to understand, and it calls for intelligence in its application. On the other hand, it is cumbrous, whereas true proportion is elegant, and it would be a pity if, simply because a method has been unskilfully used, it were abolished altogether.

The idea of proportion can be well illustrated geometrically by means of a triangle with a line drawn across it parallel to one side. The segments of the sides can be measured, and the ratios shown to be equal. From this, also, it can be shown that the product of the means is equal to the product of the extremes. Other examples can be given, *e.g.*, the number of things bought and the cost, distance travelled at a given rate, and the time taken, etc.

It may be well to let the pupils express proportion in two ways :—

$$2 : 4 :: 6 : 12$$

$$\tfrac{2}{4}=\tfrac{6}{12} \text{ or } \tfrac{4}{2}=\tfrac{12}{6}$$

They must be made to understand the meaning of the dots in the first method (see page 389).

It is useful to let the class find the missing term in a proportion geometrically, with a triangle. They may then be shown how to calculate it, using an equation form. Suggest x to stand for the missing term. Suppose, for example, the three given terms were 2, 3, 4. Then :—

$$x : 4 :: 3 : 2, \text{ or } \frac{x}{4}=\frac{3}{2}.$$

There should not be great difficulty in solving this, step by step, with the class, as a simple equation. Referring to previous work also, from the known equality of means and extremes,

$$2x=3\times 4 ;$$

a result which will agree with the former.

Other examples of proportion may be treated similarly, perhaps, after working them by the method of unity. One greatly hesitates to recommend the use of dots at all—it so easily degenerates into rule of thumb work. The essential thing in all work in proportion is that the pupil should recognise that there are two equal ratios, that the first step in any given sum is to obtain these two ratios, that in a true proportion the product of the means equals the product of

the extremes, and that therefore an algebraic equation is inevitable. Clearly, too, the x may occupy any term.

Hitherto the proportion considered has been direct. Inverse proportion is much more difficult to explain. It may be illustrated by the factors of a given number—if one be halved, the other must be doubled, and so on. Other examples are, the rate of a train and the time taken to travel a given distance, the number of men employed on a given work and the time taken, the cost of a number of articles and the number bought for a given sum of money, the length of the lever arm and the force required, the volume of a gas and the pressure upon it, etc. If this point is made clear, the rest of the work will follow the same steps as for direct proportion.

Compound proportion can hardly be taught intelligently without working the steps separately. Then it may be shown how the two results may be combined in one sum. Proportion is undoubtedly a most difficult thing to teach well, but it will repay time and trouble in the increased grasp it gives of arithmetical principles. There is a great deal to be said for leaving the teaching of proportion proper for a much later period than when the unitary method is taught.

It should not be too much to expect that a pupil who grasps the principles thoroughly should be able, after practice, to write down an answer in a single step, without the intermediate ratios; for example, if the sum were: Seven articles cost 5s. 10d., what will be the cost of fifteen articles, the answer could be written at once as $\frac{15}{7} \times$ 5s. 10d.

One point to guard against is a stereotyped form of example. It is said that a tradition existed amongst schoolboys that all sums beginning with "if" were proportion!

Possibly with older boys some more of the geometrical truths connected with proportion might be investigated, *e.g.*, the relation existing between the sides of similar plane figures and their areas. The similar figures must of course be of a fairly simple kind.

"Averages" are not taught half as much as their importance deserves. Many exercises involving "common sense" can be suggested. A class of children (Standard IV.) have the following ages:—

10 years 2 months.	10 years 1 month.
10 „ 3 „	10 „ 4 months.
10 „ 2 „	10 „ 3 „
10 „ 2 „	10 „ 1 month.
10 „ 3 „	10 „ 2 months.
12 „ 9 „	10 „ 2 „

Will their average age be nearer 10, 11, or 12? Will the one case, 12 years 9 months, have much or little influence?

Again, the teacher may deliberately include in the above list some utterly absurd number (say, 18 years 3 months), and find out what the class proposes to do with it.

"Averages" should also be introduced in connection with mensuration. A number of children can be set to measure a certain quantity. The results vary. Which is right? How can we get the most reliable result? Or, again, the same quantity can be measured (1) by a rough eye estimate, (2) by means of a boxwood ruler, (3) by a more exact measuring instrument. Shall we now take the average of the three results or not? Another problem: find the average of all numbers from 1 to 100; how?

Questions on simple interest should not present great difficulty to pupils who understand what percentage is. Certainly a formula should be avoided. If our pupils become bank-clerks, they will have plenty of opportunities for learning such tricks. It is at least questionable, whether more should be attempted in connection with discount, stocks, etc., than will give an intelligent idea of these terms. Whatever work is done in these branches should be accompanied by explanations of commercial terms, such as a general description of what is meant by stock, discount, etc., and why such things are used.

Interest, Stocks, etc.

Square Root.

The teaching of square root is facilitated where the class is familiar with the algebraic formula $(a+b)^2=a^2+2ab+b^2$. Where this is not known, it will be necessary to demonstrate the truth of it by examples and by drawing a figure (*e.g.*, Euc. II. 4).

When this is understood, the method of finding square roots can be illustrated by an example, *e.g.*, to find the square root of 1849:—

$$1849=a^2+2ab+b^2=a^2+(2a+b)b$$

$$a^2=40^2 \quad =1600$$
$$2a+b=80+3 \quad \overline{249}=2ab+b^2$$
$$(80+3)\times 3=249.$$

$\therefore$ square root is 43.

The idea that the pupils must grasp is that when a part (a) of a square root has been found, and a^2 subtracted from the given number, the remainder is equal to ($2a$+remaining part of root)$\times$remaining part of root. By means of the powers of ten, the reason for spacing the number into periods of two digits, beginning from the unit, can be shown.

It will be well to work some examples with the cyphers written down, as in the above sum, and the class can be shown that the spacing does away with the necessity of writing these cyphers.

Pupils should be able to tell at sight if a number may be a perfect square; *e.g.*, no perfect squares end in 2, 3, 7, 8, or an odd number of cyphers. No number ending in 5 can be a perfect square, unless it ends in 25, etc.

A useful plan for oral work is to write on the blackboard the squares of 1, 2, 3, 4, etc., and then ask for rough values for the square roots of, say, 18, 23, 41, etc. In asking for the square root of 80, for instance, the class may be asked whether the root is nearer 8 than 9.

The finding of square roots by factors is another useful exercise, and graphical methods should not be neglected. The Italian method of division should be used in working

examples in square root as soon as the pupils become fairly certain of their ground.

Cube root is so little used that it is at least doubtful whether, in an elementary school, it is worth while teaching the method. But the cubes of 2, 3, 4, etc., should be familiar.

Logarithms.

In the senior class of a good elementary school logarithms may very well be introduced. They are useful with compound interest, and with all lengthened multiplications and divisions. This will necessitate a knowledge of the method of expressing powers by indices. This can be introduced in earlier stages, so that by the time pupils are introduced to logarithms they know the rules for multiplying and dividing powers of the same number. Naturally a full and complete explanation of the underlying theory cannot be given, but there will be at least sufficient basis to make the whole intelligible. A good method of introduction is to construct a table of powers of two on the blackboard, and show its advantages for multiplication and division. The rules for finding the "characteristic" in common logarithms will require careful teaching, and there is a very common error of method which must be guarded against. This may be illustrated by a very simple example. Suppose the sum is:—

$$\frac{7\times 3}{2\times 13}$$

This is commonly set down, after the logarithms have been found:—

$$\frac{7\times 3}{2\times 13}=\frac{\log.\ 7+\log.\ 3}{\log.\ 2+\log.\ 13}$$

Mensuration.

It is unfortunate that mensuration is so often marked off as a separate subject. This subdivision is quite unnecessary, and for many reasons one does not want to see arithmetic and mensuration as separate subjects on a school time-table.

This branch of arithmetic is particularly rich in possibilities of practical and experimental work. The rules for finding the areas of rectangles, triangles, and circles can all be found experimentally, with squared paper. Rooms, etc., may be measured, plans drawn, and areas found. The important relation between the sides of a right-angled triangle may be investigated by direct measurement. The triangle of sides 3, 4, and 5 is specially important as proving, or rather illustrating, this relationship most simply (Euclid I., 47). The pupils may have solids to measure, in order to find surface area and volume. The balance, too, may be used for such things as finding the area of a country (drawn on cardboard and cut out), and for comparing the volumes of a cone and a cylinder of the same base and height. In higher classes, the terms density and specific gravity may very well come into use, and the pupils introduced, experimentally, to the principle of Archimedes. There is scope for ample work for upper classes in finding weights of materials, such as girders, deck-plates, etc., with given dimensions. There is no reason why, if the exigencies of time allow of it, some elementary surveying should not be done.

In the same connection, a little elementary trigonometry may be introduced to senior classes. The meanings given to the terms sine, cosine, tangent can be explained, with reference to acute angles. Perhaps a few hints as to their origin may be thrown out. The difficulty of remembering these terms may be reduced by the aid of the following mnemonic:—If the sides of the right angle are called the Hypotenuse, Opposite (the angle concerned), and Adjacent, the words SOH, CAH, TOA suggest the three functions.*

Practice can be given in measuring the functions of various angles, and in constructing angles with given functions. Simple problems in measuring heights and distances can follow from this. If a sextant or simpler form of angle meter be

* This is, I believe, a suggestion made by Professor F. R. Barrell, of University College, Bristol.

available, some practical work may be done in measuring heights. A set square with two equal sides adjacent to the right angle enables the breadth of a river to be discovered without crossing it (see p. 123), and the school district can easily be made to provide imaginary rivers, *e.g.*, a road.

Graphs.

Graphical work is always interesting to a class. The subject may be introduced by reference to the weather charts in the newspaper. In a very short time the pupils grasp the idea, and after being told the few necessary facts as to choice of scale, they can be given some graphs to plot from experimental or statistical data. One difficulty that may arise is that of knowing whether to join the points by a series of straight lines or by a smooth curve. The best guide to this is the eye—do the points look as if they lie on a continuous curve? Possibly in the first stages their eyes may fail to tell the class this, but it will not be long before they can discriminate. It should not be difficult, a little later, whether algebra is taught or not, for the class to be able to plot the graph of a linear equation, and hence to solve simultaneous equations graphically. One would begin by telling the class that x stands for any distance measured horizontally, y for any distance measured vertically. Plot first, graphs such as $x=2$, or $y=4$, then some like $x=y$, $x+y=3$, gradually increasing the difficulty of the examples. It would be necessary to explain the idea of a negative quantity, and the axes give an admirable way of doing that.

Curves may be plotted for height and age in the class, or height and weight if possible. The difficulty with these particular curves is that the data are so comparatively few that the exact course of the curve is difficult to determine. The all-important "normal curve" used by Galton and others for statistical purposes may be specially referred to as *significant*, even if its significance can only faintly be understood. Many branches of the arithmetical work can be drawn upon to supply graphs, *e.g.*, proportion, interest, functions of angles, etc.

Curves may be plotted in connection with the science course, or, conversely, may be interpreted; thus a rectangular hyperbola should at once suggest "inverse proportion," as in the case of Boyle's Law. Another useful application of graphical work is for finding square and cube roots, for transforming thermometer scales or units of measurement (*e.g.*, pounds to kilogrammes), and for solving problems (especially those on relative positions of two trains at given times, or of men walking, etc.).

Equations.

Mention has been made before of the value of the equation form in solving problems. There seems no reason at all why the simple equation should not be taught in connection with arithmetic, quite apart from an algebra course. A simple problem such as the following can be solved quite neatly in equation form: "A boy has a certain number of marbles. If he had 12 more he would have 30. How many has he?" The use of x for the required number should not present great difficulty. It is suggested, therefore, that in view of its neatness compared with other methods, the simple equation should be used in arithmetic. One might even tentatively suggest the simple simultaneous equation also.

With a knowledge of equations, the pupil will not be so likely as at present to fall into the trap described below. The teacher experiences a strong temptation to insist on rigidly conventional methods of solving arithmetical examples; a fair show can thus be made at the terminal examination, provided the questions there set are of the expected pattern. But the results of this conventionality are disastrous. Ask a class to compare the two fractions $\frac{3}{4}$ and 0·75, and the equality will probably be noticed (the tendency to change decimal fractions to vulgar is excessive; the reverse process is often preferable); but, if ·01 is now added to the second fraction, which thus becomes 0·76, the class will *start afresh* the process of comparison, instead of recognising how original equality has been disturbed.

The relative values of "accuracy" and "approximation" are not usually understood. Ask a class, "Which answer to a sum is better, an exact one, or a rough one?" and the reply will be, as a rule, "An exact one." Occasionally, if the teacher has recently been teaching approximations, the verdict will be in favour of "a rough one"; or, perhaps, a sharp boy will suggest that "sometimes an exact answer is better, sometimes a rough answer," or that "a rough answer is better, if it can be obtained quickly." The matter needs careful consideration; "rough" answers are not asked for as much as they should be. Take a sum like the following:—

69 articles at £1 19s. 6d. each;

a class should see almost at once that the cost will be rather less than £140; *less* for two reasons. Or the following:—

What must I gain on goods that cost £65 in order to gain 5 per cent.?

£65 is just about $\frac{2}{3}$ of £100; hence the gain will be about $\frac{2}{3}$ of £5 (£3 6s. 8d.). Will it be a little more or a little less?

Approximate and Contracted Methods.

One rather hesitates to recommend the use of approximate methods until the pupils clearly understand the difference between absolute accuracy and practical accuracy. With younger children there would be a great danger of the development of the idea that accuracy in working did not particularly matter. In senior classes contracted methods of multiplying or dividing numbers should be taught. The multiplication gives little difficulty, if the plan has been adopted of beginning with the highest digit of the multiplier, and some practice given in pointing each line as the work proceeds. It is best to work to two places more than are required. When the number of decimal places in the working is sufficient for the purpose, the digits of the multiplicand are omitted, instead of moving each line one place to the

right; *e.g.*, multiply 3·56827 by 5·2634 correct to 3 decimal places:—

	Contracted.
3·56827	3·56827
5·2634	5·2634
17·84135	17·84135
·713654	·71365
·2140962	·21409
1070481	1070
1427308	142
18·781232318	18·78121

Here there are 5 decimal places in the first line of the multiplication. Hence, in multiplying by the next figure, 2, omit the 7 in the multiplicand, merely carrying the 1 from it to the next figure. In the next line, the next figure, 2, is omitted, but as $6\times2=12$, 1 has to be carried.

It is essential in this that the pupils shall ascertain beforehand roughly what the answer will be.

This method is preferable to the one given in some textbooks, where the multiplier has to be written backwards.

In approximate division, the process consists in omitting figures in the divisor instead of bringing down those in the dividend. The best method to adopt is to ascertain first how many figures there will be in the quotient, and arrange so that there shall be two figures in the last divisor, *e.g.*, divide 17·85637 by 2·63491 correct to 3 decimal places.

Here there will be one digit in the whole number of the quotient, and taking the quotient to 5 decimal places, there will be 6 figures in the quotient. Therefore figures may be omitted in the divisor after the second place, remembering to carry figures from the number omitted.

2·63491) 17·85637 (6·77684
2·046910
·202473
18030
2221
114 Ans. **6·777.**

The value of 6·7768 to 3 places of decimals is 6·777. The reason for increasing the last figure retained by 1, if the first figure omitted is 5 or more, can readily be shown by means of a scale drawn on the blackboard.

Examples should be given in obtaining results to the nearest inch, penny, shilling, etc. It is as well, too, that pupils should be able to estimate the error involved by an approximation, as a percentage of the whole. They are very apt to imagine that it is the actual *amount* of an error that matters, *e.g.*, that an error of an inch in measuring the side of a small box is no more important than the same error in measuring the height of a mountain. There are useful short methods in many arithmetical operations, and some of these might well be shown in the upper classes of a school.*

Geometry.

A great many of the fundamental theorems of geometry can be demonstrated experimentally by drawing figures, folding and cutting out. The methods form an admirable introduction to formal geometry. One who has been through a course of this experimental geometry can approach the rigid proofs without that feeling of utter strangeness that gives terror to "Euclid" lessons. A few suggestions may be given of theorems which may be demonstrated in this way:—

The congruence of triangles with given equal parts, by cutting out and superposition.

The sum of the angles of a triangle, and of the exterior and interior angles of a polygon, by cutting out the angles or by measurement with a protractor.

The properties of the isosceles triangle, by folding.

The conditions of parallelism of two lines cut by a transversal.

Many of the properties of circles, *e.g.*, the size of the angle in a semicircle, the conditions of tangency, cyclic quadrilaterals, the angle in a segment, etc.

* See *Short Methods in Arithmetic.* Eastwood and Lightfoot. (Ralph Holland & Co.)

The more important constructions would be taken as well, the correctness of the results being demonstrated by measurement.

It is probably a mistake to trouble about rigid definitions to any extent, except where necessity demands it. At any rate, such points should be omitted in earlier stages.

By this experimental work a very valuable body of geometrical knowledge can be built up with far less trouble than by any formal methods, such as those of Euclid.

There are many other points that must be attended to if the mathematical teaching is to be successful. One can hardly over-emphasise the importance of copious oral work in connection with any rule under consideration. This will do much to ensure understanding. Boys are frequently unable to use even the simplest mathematical terms, like "product," "digit," etc., with any fluency. Indeed, "oral composition" is quite possible in connection with mathematics.

General Hints.

In the written work the teacher must strive to obtain logical arrangement and neatly made figures. Slovenly work, with figures hardly recognisable, is responsible for much inaccuracy, and for this reason bad figures should not be tolerated.

Still, rapidity as well as accuracy should be aimed at. It is a good plan to set a time limit for a certain number of sums.

Variety in the examples set is very desirable. The teacher should not restrict himself to the text-books, but should be continually on the look-out for material. He will find it almost everywhere. Trade catalogues, Board of Trade Returns, the financial columns of newspapers—these are but a few of the sources he can draw on, in addition to those mentioned earlier in this chapter.

Vigilance is necessary to prevent copying, which is easy—and fatal—in this subject. The teacher must do all in his power to check it. It is not always possible to set different work to boys in the same desk, but it is sometimes advisable.

The influence of the teacher, and the knowledge of his strong disapproval should be of great weight. When cheating does occur it should be met with severe displeasure and appropriate punishment. Sometimes, however, pairs of boys may be allowed to discuss a problem, and perhaps collaborate in its working; but such collaboration must be an understood, not a furtive thing. It should be added, that some thoughtful teachers are convinced that the insistence on written arithmetic in Standards I. to III. is a mistake; and that though much mental arithmetic, embodied in stories and sundry practical occupations, is desirable, the analytic method (pen and paper) is premature. They infer this partly from the great difficulty of teaching the subject, and partly from the psychological principle that abstract reasoning power is not normal before the age of ten.

The great need in mathematics is to make the subject more attractive; not that it is in any way the most unpopular subject, but it is rare to find the enthusiasm in its study that one finds, say, in science or literature. The increasing use of practical methods is doing a great deal in this direction, and this is all to the good. Make the work as practical as possible; make it contribute to the "æsthetic revelation of the universe"; at the same time do not forget that the study is in its nature a hard one, and that, more than in many subjects, patience and sympathy, added to broad knowledge, are the most valuable assets of the teacher.

(W. J. S.)

CHAPTER XIX.

A Dogma and a Dream.

The treatment of the primary school curriculum is now at an end. But the reader, despite sundry controversial references to "formal training" and to the rival doctrine of "interest," may still feel uncertainty as to whether this rivalry is not fictitious. We have all become so used to mere phrases ("drawing out," "example not precept," "method rather than matter," "don't cram with facts," and so forth), and have convinced ourselves that they do not count for much in practice, that there is some doubt whether any other set of phrases will be received with credence and enthusiasm.

The present book will have been written to no purpose if any reader leaves it with the belief that the controversial matters upon which it occasionally touches are unimportant. In view of the fact that the vast majority of the English nation pass through the primary schools on their road to the full rights and responsibilities of citizenship in a supposedly democratic country, the importance of our having sound views of education is simply incalculable. The least swerving of an educational dogma from actual truth means an eternity of loss to humanity; and the smallest addition to our stock of educational truth means an eternity of gain. Consequently, if the dogma of "formal training," or "faculty training," is false, either wholly, or mainly, or to the smallest degree, this world is the scene of a silent tragedy. Man is failing to snatch from the passing centuries and æons the treasures of virtue and wisdom that might be his.

I insert in this chapter, therefore, a series of questions:—

Does there exist a "faculty of observation" in any measure distinct from the rest of the mind? And, if so, can such a "faculty" be "cultivated" or "trained" by a course of "object lessons" or by the stiff study of physics or chemistry? After such a course, is the boy any more "observant" of the tree that blossoms outside his door, or of the parasites that harbour in his favourite dog? *No one in England can positively affirm that he is; he may be, but there is no proof; and the Herbartians are inclined to deny that he is.* "Observation," they say, follows interest and apperception.

Is there a "faculty of reason" in any measure distinct from the rest of the mind? And if so, can such a faculty be "cultivated" or "trained" by a course of mathematics or grammar? After such a course, is the boy more capable of "reasoning" about quite alien matters (*e.g.*, the character of Shylock, or the origin of protective resemblances among insects?) *No one in England can positively affirm that he is; he may be but there is no proof; and the Herbartians are inclined to deny that he is.* "Reasoning power," they say, is rooted in "interest and apperception."*

Is there a "faculty" of "neatness," or "accuracy"? Or, dropping the word "faculty," can we cultivate a general tendency to "neatness" or "accuracy" or "exactness" by purely "formal training," and apart from instruction, insight, apperception, and interest? If we compel a boy to be "neat," or "accurate," or "exact" with his writing or his sums, will that neatness or accuracy or exactness flow over into other departments of life? *Here we have definite statistics to the negative.*† We now know—at least we are now fairly certain—that mere "training in neatness," and mere "training in accuracy," are ineffective. If we wish

* See, too, the footnote on p. 394.

† See my *Education and the Heredity Spectre*, with its quotations from Bagley and Thorndyke.

to cultivate "neatness" and "accuracy"—the very qualities mentioned as test qualities by an English advocate of formal training, Mr. J. L. Paton,—we must fall back on Herbartian categories. Certain exhortations proceeding from the British Association and other sources are thus to be obeyed only with a considerable measure of caution. It is not certain that if we learn *blindly* to "weigh—weigh—weigh," we shall become exact in all matters of life. And, after all, is exactness a virtue *in itself*?

Is there a faculty of "will," or "effort," or "concentration," or "perseverance"? And if so, can it be cultivated by making a boy work hard (whether he like it or not) at a dry subject? Does drudgery "train the will"? Almost every secondary teacher in England says, "Yes," and proceeds to impose a fresh set of Latin verbs. But no one really knows; there is no definite proof. Or, rather, whatever proof there is seems of a negative kind, and can be found in works like Mr. A. C. Benson's *Upton Letters* or Kappa's *Let Youth But Know*. (See Vol. I., pp. 196, 197.)

Does the "faculty," or "quality," of healthy *esprit de corps* in games and other school pursuits—the willingness to work with others harmoniously and vigorously, whether in subordination or in leadership—does this pass over into adult patriotism? The dogma of "formal training" or "faculty training" says "Yes"; Sir Arthur Hort at the International Moral Education Congress said "No," and asked for an explanation of this disappointing fact. The explanation probably is that our great public schools have thought too much of "faculty-training" and too little of instruction, insight, and interest.*

One "faculty," indeed, seems admittedly in a very bad way indeed—that of "memory." Few teachers now set tasks for the purpose of "improving," or "training," the memory, though,

* In the *School World* for November, 1908, I have summarised the evidence against the dogma of "faculty training."

less than half a century ago, such a policy was regarded as eminently sane. And, on the whole, I doubt whether, half a century hence, we shall teach subjects for any "faculty training" purposes whatever. We shall teach them because they are full of meaning, because they illumine and dignify man, and make life indeed worth living. *Of course* boys and girls will "observe," and "reason," and "will"—what else should they do in those glorious days of the future, when stress will be laid rather upon living matter than upon dead method, when learning will no longer be task work, when teaching will have become easier and yet far more exciting and exacting than at present, and when barren studies and purely formal exercises will be almost things of the past?

These, faintly indicated, are some of the results I foresee from the "downfall of the dogma of formal training." But, perhaps, that dogma will not fall! Perhaps we shall learn that there is truth in it! I know not. Nor does anyone with certainty. Some day, let us hope, we shall know. I have an opinion already.

Let, then, the reader of this book, whenever he hears that certain studies or pursuits "train" this or that faculty—or "train the mind" in general—try to find out what (if anything) is meant, and put the matter to a test. At present education is helplessly and ignominiously hung up, because no one really knows whether "formal training" or "faculty training" is, or is not, the name of a colossal delusion.

. . . . . .

One closing remark, very *à propos* to the last. English books on school management have never yet dealt with the "open-air school." How could they? The open-air school is not yet two years old. But the omission of any mention of it from this book would be a grave fault, which I do not intend to commit. Let me show in these words, written at the close of one epoch and at the silent advent of

another, that in the open-air school we may find a solution of nine-tenths of our educational difficulties.

There will be improved health on the part of children and teachers; there will be smaller classes; and even the religious difficulty will seem a ludicrous one when schools meet in the open air. The very words "atmosphere" and "right of entry" will sound strange.

The "dogma of formal or faculty training" may experience the gentlest of "downfalls." No "fervent" Herbartians like myself will be needed to impeach its soundness; formal subjects will seem so out of place amid running water and chirping birds, that deliberate defences of "drudgery" as cultivating "will power," or of parsing and analysis as "training the mind," will no longer be adduced. Our pupils will learn *reasonable* "accuracy" (the only kind that is of any use), and various other *reasonable* qualities,* in pursuing their daily tasks, in mending or making clothes, in planning and executing their gardening operations, and so forth. No doubt, there will be *instruction* on these and other moral and social matters, for there exists ample evidence to show that neither children nor adults can learn all the ramifications of moral and social duty merely from a series of occupations; the element of elucidation, explanation, and amplification has, sooner or later, to be introduced. Still, our moral and civic instruction will be far more successful in a school society, where each member has rights and duties, and where the avocations are health-giving and natural, than in the artificial schools of the present day.

Then, too, how all the curriculum will be aided! We shall have no need of plasticene or sand to teach geography; we shall use the streamlets and hillocks that nature has provided, and make others of our own. Our arithmetic will be eminently practical; the measurement of tree trunks and of the areas of

* Neatness, punctuality, esprit de corps, etc.

fields, the calculation of how many plants can grow in a certain space, and other problems of that type, will bring the subject near to the minds and souls (*viâ* the hands and eyes) of our pupils. Nature study, geology, and even—most wonderful good fortune—astronomy, will be pursued with ease. We shall scarcely need "school gardens," for our schools will themselves be gardens. History and literature will be taught—and acted.

Is this a dream? Perhaps, for the moment; but it will soon be taking to itself a local habitation and a name in our modern England. Maybe this book will be the last ever published in which the four-walled class-room and the old-fashioned time-table of separate subjects will be assumed.

(F. H. H.)

APPENDIX I.

Bibliography.

Chapter I.

The "psychology" of Herbartianism has been set forth in Professor Adams's *Herbartian Psychology* (Isbister), but this psychology, though extremely suggestive, is not to be regarded as final or unalterable.

In advanced circles the latest tendency is to start from an analysis of human instincts; but a large part of the working of the psychical mechanism can still be easily and helpfully interpreted in Herbartian terms, and the convenience of the latter is indicated by Mr. Keatinge's employment of them, as well as by such passages as those on p. iv.

The following three works, by the editor, deal with certain aspects of Herbartianism:—

The Secret of Herbart. (Watts. 6d.) Moral signifiance of "Interest."

Education and the Heredity Spectre. (Watts. 1s. and 2s.) Gives a summary of recent work in "Heredity"; discusses how far heredity interferes with or aids the educative process; deals with the evidence against the dogma of "formal training," and with the controversy over "direct" and "indirect" moral instruction.

The Meaning of Education as Interpreted by Herbart. (Ralph, Holland & Co. 2s. net.) This is the first volume of

the present series, and consists of a running commentary on Herbart's teaching, with ample quotations from his works.

Attacks on "formal training" are found in Bagley's *Educative Process* and O'Shea's *Education as Adjustment*. The question is likely to be a burning one in the next few years; and in the absence of further evidence in favour of the doctrine, teachers will be driven on to the Herbartian and Fröbelian position. (Macmillan.)

Dr. Dewey's *School and the Child* (Blackie) is fifty years in advance of present day educational thought in England; but the student may well study it for the sake of the vistas it opens up. Dr. Dewey is one of the few educational writers who have something to say.

Dr. Stanley Hall's *Adolescence*, or his smaller volume, *Youth* (Appleton) may be studied for the same purpose. Teachers in evening schools will here find enough mental food to last them their lifetime.

Dr. McDougall's *Social Psychology* (Methuen) deals well with the primary "Instincts."

Solid books like Dr. Archdall Reid's *Principles of Heredity* (Chapman and Hall) and Professor J. Arthur Thomson's *Heredity* (Murray) grapple with questions which will ultimately be regarded as fundamental for education. Indeed, the teacher who wishes to know his subject had better discard for a time books on "education," and turn to those written from another standpoint, and therefore comparatively free from traditional claptrap. He will return to "education" with fresher views.

Books of a General Character:—

Recent English books on "school management" show a considerable improvement on those of a dozen or twenty years ago, but their authors are still too often obsessed by the "faculty doctrine," and lay stress on method rather than on subject matter. On the whole, American text-books are far more stimulating and constructive, and, because of a

more definitely sociological and psychological treatment, more philosophic and profound. Among the valuable and helpful books that have recently appeared in our country should be mentioned:—

Suggestions for the Consideration of Teachers. (Board of Education. Wyman.)

The Art of Teaching. (David Salmon. Longmans, Green & Co.) A commonsense and practical work.

The Practice of Instruction. (Edited by Adamson. National Society.) Sound and up to date. Includes some treatment of secondary school subjects.

The Principles of Education. (Raymont. Longmans.)

An excellent series of practical Herbartian manuals comes from Dr. McMurry—*Elements of General Method* and eight other works on the various subjects. (Macmillan) They combine "practice" with "theory" in a way that English books have mostly failed to do.

Teaching and Organisation. (Edited by Barnett. Longmans.) Useful for secondary schools in particular.

Principles of Class Teaching. (Findlay. Macmillan.) A book that embodies much Herbartian thought, and presents the problem of the curriculum in a lucid and novel way.

School Management and Methods of Instruction. (Collar and Crook. Macmillan.) A good practical manual, in which, however, "faculty" notions are too prominent.

Chapter II.

The best students' manual on the modern study of the Old Testament is Professor Driver's *Introduction to the Study of the Old Testament.* (T. and T. Clarke.) But this is a book for constant reference rather than for pleasurable enjoyment. In the latter category two books stand out, namely: Professor George Adam Smith's *Isaiah* (Hodder and Stoughton) and Mr. C. J. Montefiore's *Bible for Home Reading* (Macmillan.) The latter is the work of a broad-minded Jew.

Matthew Arnold's little edition of the last portions of Isaiah, *The Great Prophecy of Israel's Restoration* (Macmillan), contains the best defence of the retention of the Bible in schools that has ever been written; and as Arnold was neither a "Nonconformist" nor an ardent believer of any kind, his defence is significant. Able and controversial is also the Rev. Stuart Headlam's *The Place of the Bible in Secular Education* (Brown, Langham & Co.). Matthew Arnold's *Literature and Dogma* has had an immense though incalculable influence.

The little books which constitute Professor Moulton's *Modern Reader's Bible* (Macmillan) represent a unique attempt to make the literary form and charm of the Bible apparent. They will be a revelation to readers accustomed to the wretched "verse" arrangement of the ordinary text. Questions of criticism are omitted.

Lessons from the Old Testament (Canon Glazebrook. Rivington) consists of selected continuous passages, with scholarly notes, maps, etc. The book is in considerable use in secondary schools.

Several works on Old Testament history show the ever growing interest taken in that subject. Among them may be mentioned as scholarly and moderate in tone: *Lessons in Old Testament History* (Aglen. Arnold); *Old Testament History* (Fry. Arnold); *The Biblical History of the Hebrews* (Foakes Jackson. Heffer, Cambridge). Miss Bramston's *Dawn of Revelation: Old Testament Lessons* (Warren. Winchester) is also helpful and readable.

Chapters III. and IV.

Moral Education. (Griggs. Huebsch, New York.) A sound philosophic treatise on the various educational agencies, instruction, training, etc., that bear on the moral life.

The Making of Character. (MacCunn. Cambridge Press.) Probably the best English work on the philosophy of moral education.

The Moral Instruction of Children. (Adler. Arnold.) Similar in design to Griggs's book, with many hints.

Two volumes recently issued are of great importance. *Moral Instruction and Training in Schools: Report of an International Inquiry* (edited by Michael Sadler. Longmans), and *Papers on Moral Education Communicated to the First International Moral Education Congress.* (Edited by Gustave Spiller. David Nutt.)

Among citizenship books may be mentioned: *British Citizenship, Its Rights and Its Duties.* (Peaker. Ralph, Holland & Co.)

For actual moral instruction *material* the teacher must turn to Mr. F. J. Gould. This promising domain has, amid all the controversies of the last thirty years, been left to him almost alone. He has issued:—

The Children's Handbook of Moral Lessons. Full of illustrations from history, travel, etc. (Four volumes so far have appeared. First volume, popular edition, at 6d. Watts & Co.)

Life and Manners. Similar to the above. (Sonnenschein.)

Messrs. Nelson & Son are issuing a series for the Moral Instruction League (6, York Buildings, Adelphi). It already includes *Garden of Childhood*, and other works. (Miss Chesterton.) Another series is issued by Messrs. Blackie & Son.

But much work remains to be done in this domain, more particularly in the direction of linking morals and civics to literature, history, etc. Selections from Milton's prose, from Burke's works, and the like, might be of service, as also would the study of the great utopias. But probably such a treatment would be more suitable for the secondary or evening school than for the primary.

Chapter V.

The Study and Teaching of English. (Chubb. Macmillan.) Probably the best book on the teaching of English *literature* that is at present in the field. Though written for American

schools, it is almost wholly applicable to English ones, and any unfamiliarity of tone or terminology is probably an advantage. Excellent chapters also on grammar, composition, etc.

CHAPTER VI.

Cambridge Modern History.

Political History of England. (12 vols. Longmans.)

The World's History. (Helmott.)

European History. 476-1871. (Hassall.)

Western Civilisation. (Cunningham.) An excellent summary.

History of Civil War, etc. (Gardiner.)

History of Commerce in Europe. (H. de B. Gibbins.)

Industry in England. Historical outlines. (H. de B. Gibbins.)

Oliver Cromwell. (Morley.)

Oliver Cromwell. (Gardiner.)

Twelve English Statesmen Series.

English Men of Action Series.

Lectures on Modern History. (Acton.)

Historic Towns. (Longman.)

Mediæval Towns. (Dent.)

History of Our Own Time. (McCarthy.)

London. (Loftie.)

Stratford-on-Avon. (Sidney Lee.)

London Afternoons. (W. J. Loftie.)

London, Westminster, East London, South London. (Besant.)

Constitutional History. (Hallam and Stubbs.)

Relation of Geography and History. (George.)

Books a Teacher should have:—

History of England. Illustrated edition, 4 vols. (Green, Macmillan.)

Students' History of England. (Gardiner. Longman.)

Historical Geography of British Empire. (H. B. George. Methuen & Co.)

Historical Geography on a Regional Basis. (Dann. Dent & Co.)

Expansion of the British Empire. (Clough. Ralph, Holland & Co.)

A Concise History of Europe. (Forbes. Ralph, Holland & Co.)

Epochs. (Longman.)

Original Source Books, such as *Life and Letters of Oliver Cromwell*, and such books as are given in *Leaflet No. 7 of Historical Association.*

School Books:—

History of England. (D. Innes, M.A. Cambridge Press.)

English History, Illustrated from Original Sources. (A. and C. Black.)

History in Biography. (A. and C. Black.)

Poems of English History. (A. and C. Black.)

Illustrative History. (Horace Marshall.)

English School Texts. (Blackie.)

Local:—

London. (Besant. Longmans & Co.)

London, Scotland, Wales, Midlands, North Country, Lancashire, Yorkshire, West Country, East Country Series. (Arnold.)

Middlesex and London, Surrey, Somersetshire, Lancashire Series. (Methuen.)

Magazines, etc.:—

English History Review.

Pamphlets of Historical Association, etc.

The two books that follow are not so well known as they deserve to be.

The Meaning of History. (Frederic Harrison. Macmillan.) "We must look," says Mr. Harrison, "on history as a whole, trying to find what each age and race has contributed to the

common stock, and how and why each followed in its place." He traces this evolution through early man, Greece, Rome, the Middle Ages, and the French Revolution; and illustrates civic life and genius in chapters on Rome, Athens, Constantinople, Paris and London.

The New Calendar of Great Men. (Edited by Frederic Harrison. Macmillan.) Biographies of 558 worthies are arranged under the thirteen names that occur as historic types for the "Positivist Calendar," namely, Moses, Homer, Aristotle, Archimedes, Cæsar, Saint Paul, Charlemagne, Dante, Gutenberg, Shakespeare, Descartes, Frederick II. and Bichat; thus affording an orderly series of illustrations of the entire course of human evolution.

Chapter VII.

(*a*) **Books of Reference** (most of which can be seen at the Library of the Geographical Association):—

Compendium of Geography and Travel. (Stanford). 13 vols.

Central Europe. (Partsch).

North America. (Russell).

Far East. (Little).

India. (Holdich).

Nearer East. (Hogarth).

Britain and the British Seas. (Mackinder).

Scenery of Scotland. (Geikie).

Scenery of England, Scenery of Switzerland. (Lubbock).

Scientific Study of Scenery. (Marr).

Relations of Geography and History. (George).

Geological Atlas of the British Isles. (Stanford).

(*b*) **Books for the Teacher's Use:**—

The International Geography. (Mill. Macmillan).

Physiography. (Huxley. Macmillan).

Elementary Lessons in Geology. (Watts. Macmillan).

Descriptive Geography from Original Sources. An excellent collection of extracts from the writings of travellers, etc. (Herbertson. A. and C. Black. 7 vols.).

Applied Geography. (J. Scott Keltie, LL.D. Philip).

(*c*) **School Books:—**

Man and His Work. (Herbertson. A. and C. Black.) Presents in a popular form the principles of human geography, without which the history neither of the past nor of our own times can rightly be understood.

The Oxford Geographies. (A. J. Herbertson. Oxford Press).

Vol. I. *Preliminary Geography.* Gives definite pictures of the different regions of the world, with an outline of the salient topographical features.

Vol. II. *The Junior Geography.* An excellent modern textbook, full of most useful diagrams.

Vol. III. *The Senior Geography.* Treats the geography of the world according to the natural regions.

The World (J. B. Reynolds. A. and C. Black) gives vivid pictures of the most important types of scenery, with the conditions of human life which have been necessarily evolved in accordance with the surroundings. Illustrated by well-chosen pictures.

Regional Geography. (J. B. Reynolds, B.A. A. and C. Black.) The following are already issued:—Europe, Asia, America, and British Isles. Quite modern text-books; well illustrated with maps and pictures.

Commercial Geography. (C. Chisholm, M.A. Longmans.)

Historical Geography of the British Isles. (H. B. George, M.A. Methuen & Co.) An excellent book, showing how history partly depends on geography.

Historical Geography on a Regional Basis. (E. W. Dann, B.A. Dent & Co.) In this book geography is the substantive

and historical is the adjective. Geographical control is well brought out.

Professor Lyde's Series. (A. and C. Black.) Cause and effect well worked out.

A Scientific Geography. (E. W. Heaton, B.Sc., etc. Ralph, Holland & Co.) In seven books. The control of the geological structure is made prominent. Geological maps. Breaks up ground that will be new to most readers. A most suggestive and valuable series.

Practical Geography. (Simmons & Richardson. Macmillan & Co.) Full of suggestions for practical work.

Junior Course of Comparative Geography. (P. H. L'Estrange. Geo. Philip & Son.) An excellent modern text-book.

Mr. Mackinder's *Series.* Elementary studies in geography. Book I. *Our Own Islands.* An excellent book for young children; the humanistic side is splendidly developed. (Geo. Philip & Son.)

Peeps at Many Lands. (A. and C. Black.) Already issued: France, Holland, India, Italy, Japan, Scotland. Give good descriptions of the life of the people.

Magazines (can be seen at most libraries) :—

Journal of Geography; *The Geographical Teacher*; *The Scottish Journal of Geography*; *The Journal of Geography*; *Board of Trade Journal*; *Sell's Commercial Intelligence*, etc.

Chapter VIII.

For the contrasted views of Professors Hall and Armstrong see *Adolescence* (Appleton) of the former and *The Teaching of Scientific Method* (Macmillan) of the latter. No doubt a reconciliation is ultimately possible, but the student should at first keep the two stand-points distinct. In *The School World* for November and December, 1908, an outline of the controversy is given.

The "romantic" aspects of science, upon which stress is laid in the text, are well brought out in the books published by Seeley & Co., *The Romance of Insect Life*, *The Romance of Geology*, and many others. An excellent book, *The Romance of Medicine*, is the work of Dr. Macfie, and issued by another firm. The S.P.C.K. also issue a *Romance of Science Series*. For a lengthy list of books on "Nature Study" proper see Appendix II. Mention may be made of:—

The Introduction of the Child to Science. (Boole. Clarendon Press.)

A *Primer of Biology and Nature Study.* (Mundy. Ralph, Holland & Co.)

The Story of Alchemy. (Newnes.)

Inorganic Chemistry. (Shenstone. Arnold.)

Elementary Chemistry. (Perkin and Lean. Macmillan.)

CHAPTER X.

Annual Reports of Board of Agriculture and Fisheries. Contains a survey of the work undertaken by various counties in connection with school gardening. See Vol. 1904-5.

School Gardening. A complete record of work for each month, both in vegetable and flower gardens; written by teachers for teachers. (Philips. Watkins and Sowman).

Horticulture. A course of lessons to teachers. Here is provided a very extended series of questions and answers, which should be of great service to the student. (J. Wright. Macmillan).

Practical Guide to School, Cottage, and Allotment Gardening. Contains a mine of information, and is a true *vade mecum* for students and teachers. At the end is an excellent series of questions intended for the use of teachers who desire to sit for the teacher's certificate, issued by the Royal Horticultural Society. (J. Weathers. Longman).

CHAPTER XI.

Memorandum on the Teaching of Drawing. (Scotch Education Department. Wyman.)

Suggestions for the Consideration of Teachers. Pages 65 to 69—Aims in Teaching Drawing; pages 125 and 126—Good outline scheme. (Board of Education. Wyman.)

Practical Teachers' Art Monthly. (T. Nelson & Sons. 3d. per number.) Volumes I. to X. Copiously illustrated, and containing much practical matter.

Elements of Drawing. (John Ruskin. G. Allen.) Particularly Letter I., on "First Practice."

Education through the Imagination. (Margaret McMillan. Sonnenschien.) Chapter V., "The Higher Hungers—Colour"; Chapter VII., "The Child as Artist—Children's Drawings."

Adolescence, or the smaller volume *Youth.* (Dr. Stanley Hall. Appleton.) Much treatment of "motor" training.

New Methods in Education. (Liberty Tadd. Low, Marston & Co.) A complete treatise on the subject.

Proceedings of the Third International Congress for the Development of Drawing and Art Teaching. London, 1908.

A Manual of Clay Modelling. (Unwin. Longmans.)

A Complete Course of Blackboard Drawing. (Branch. Ralph, Holland & Co.) Published also in two parts:—

I. *The Principles of Model and Common Object Drawing and the Shadow Treatment of Outline Drawing.*

II. *The Principles of Drawing from Nature and the Use of the Flat of the Chalk.*

Simple Studies in Line and Mass of Common Objects, Flowers, and Designs in Monotint and Colours. (Branch. Ralph, Holland & Co.)

Chapter XII.

The Hand. (Sir Charles Bell.) One of the Bridgewater Treatises.

Manual Training. (H. Ham. Blackie & Son). One of the earliest, and still one of the best, books on the theory and history of manual training.

Handbook of Sloyd. (Otto Salomon. Philip & Son.) A very comprehensive work on the theory and practice of manual training by the famous Swedish teacher.

The Manual Training School. (Dr. C. M. Woodward. Heath & Co., Boston, U.S.A.) Deservedly the most famous American book on practical manual training.

Woodwork. (S. Barter. Whittaker & Co.) Contains the course adopted by the L.C.C., and is one of the best known and most reliable English books on the subject.

Metalwork. (J. S. Miller. Whittaker & Co.).

Cardboard Modelling. (J. C. Hudson and J. Cook. Newman & Co.).

Hand and Eye Training. (Gustav Kalb. Newman & Co.) Containing much material wherewith to "bridge the gap" between Kindergarten and Upper Standards.

Hand and Eye Training. (Dr. Goetze. Newman & Co.) The best German work on manual training. Very thorough in treatment.

Practical Education. (Charles G. Leland. Whittaker.) A work which brings into view the wider fields of manual training.

Learn by Doing. (J. H. Judd. Griffiths & Co., Manchester.) An admirable scheme of simple wood-work.

Sloyd for Upper Grammar Grades. (Gustaf Lartson. Ellis & Co., Boston.) A recent book of great value, by a prominent American teacher.

The New Education. (R. Wake. Chapman and Hall.) A well-known and useful book, containing three courses of graduated models and lessons.

Woodwork for Schools on Scientific Lines. (Baily and Pollitt. Murray.) Correlation is the keynote of this book. It contains an ordinary school course and a scientific apparatus course running side by side.

The Manual Training Magazine (America), bi-monthly, 35 cents.; *Manual Training* (United Kingdon), monthly, 1d. Both these journals to be obtained from J. T. Baily, Spencer Park, St. Albans.

Chapter XIII.

Needlework, Knitting, and Cutting-out. (E. Rosevear. Messrs. Macmillan.) Contains the various drills taught in Infants' Schools; all the processes of plain needlework, knitting, and cutting-out, with directions for making the different garments.

Needlework and Cutting-out. (A. Walker. Longmans.)

Complete Course of Needlework, Knitting and Cutting-out. (T. M. James. Longmans & Co.)

"*A. B. C.*" *of Needlework.* (B. L. Blackmore. Ralph, Holland & Co. 1s. 6d. net.) Contains the various processes in plain needlework and knitting.

Chapters XIV. and XV.

Miss Dale's works: *On the Teaching of English Reading*, and *Further Notes on the Teaching of English Reading* (Philip & Co. 2s. 6d. net.), should be read by all teachers.

Sonnenschein's *Reading in a Twelvemonth.* (Sonnenschein. 2s.) Discusses, in the Introduction, the best methods of teaching the subject.

Clear Speaking and Good Reading. (Burrell. Longmans.)

Professor Wyld has brought out a series of books dealing scientifically with the historical, philological and practical aspects of language teaching. *The Teaching of Reading* may be especially recommended to all teachers, whom it will introduce to the elements of phonetics. (Murray.)

Various firms publish school anthologies, among which may be mentioned:—

The Boys' Book of Poetry. The Girls' Book of Poetry. (Macmillan.)

A Book of Verse for Boys and Girls. (Smith. Clarendon Press.)

The Laureate Poetry Books. (Arnold.)

The Divisional Poetry Books. (McDougall.) These have a few notes.

An Introduction to Good Poetry. (Davidson. Blackie.)

The Golden Treasury and *The Children's Treasury.* (Macmillan.)

The Clarendon Press also issues little threepenny selections from all the chief poets. Edited by Quiller Couch. From the same firm comes an enlarged *Golden Treasury* for 1s.

Mr. Stead's *Penny Poets* and *Books for the Bairns* are almost too well known to need mention. They continue to do their splendid work of popularising literature.

Of school *Reading Books* there are many. Mention may be made of the *Correlated Readers* (History, Geography, and Literature) published by Arnold.

The number of books on teaching composition is yearly growing. Wilson's *Lingua Materna* (Arnold) is justly popular. In the *Combined Course of Literary Reading and Composition* (Messrs. Blackie) an attempt is made to teach composition through literary masterpieces. Excellent pictures are included in the book. In other works, such as *Higher English* (Rahtz. Methuen) composition is kept close to grammar rather than to literature. Anglo-American firms (Harrup, Ginn, Macmillan, etc) have recently issued many American works on the teaching of English, and most of these can be recommended, *e.g.*, *Elementary Composition.* (Caufield and Carpenter. Macmillan.)

Various books on essay writing are in the market; among them may be mentioned *Essays and How to Write Them.* (Forbes. Ralph, Holland & Co.) *Essays in the Making.* (Eustace Miles. Rivington.)

Chapter XVI.

The Theory of Music for Students and Teachers. (Lightfoot. Ralph, Holland & Co. 2s. net.) Includes a treatment of Elementary Harmony as far as the Chord of the Dominant 9th, and deals also with voice training.

Musical Theory. (John Curwen. J. Curwen & Sons.) Almost indispensable. Or in parts—I. Common Scale and Time; II. Minor Mode and Transition; III. Musical Form; IV. Expression; V. Harmony and Construction.

The Mechanism of the Human Voice. (Emil Behnke. Curwen.) There can be no difficulty about voice registers, head voice, chest voice, etc., after reading this book.

Elements of Vocalisation. (Gaetano Nava. Augener, Limited. City Branch, 22, Newgate Street.) Nava was Santley's teacher, and, though the book is "for ladies' voices," it is a complete solo-singing course adaptable to any voice.

The Boy's Voice. (James Bates. Novello & Co.) The author is undoubtedly the most experienced boy-voice trainer living. He can be measured from the elementary school to Covent Garden opera, from the parish church choir to the Royal Choral Society. Bates's boys are known all over the country.

Children's Voices. (Maskell Hardy. Curwen.); *The Teachers' Companion.* (Curwen.); *The School Music Review.* Monthly. (Novello.); *The Musical Herald.* Monthly. (Curwen.)

Chapters XVII. and XVIII.

Story of Arithmetic. (Cunnington. Macmillan.)

History of Mathematics. (Florian Cajori. New York.)

Complete Arithmetic. (Eastwood and Lightfoot. Ralph, Holland & Co.) Exceptionally full on the side of graphs, short methods, and theory of fractions and percentages.

Short Methods in Arithmetic. (Eastwood and Lightfoot. Ralph, Holland & Co.)

Practical Arithmetic. (Knowles and Howard. Longmans.) In seven books, with special teacher's books. Includes geometry and some algebra.

Practical Mathematics. (Castle. Macmillan.)

Lectures on the Logic of Arithmetic. (Boole. Clarendon Press.)

The Teaching of Practical Arithmetic to Junior Classes. (Martin. Harrap.)

An Elementary and Intermediate Algebra. (Lightfoot. Ralph, Holland & Co.) Extremely lucid and practical. Concrete problems are introduced from the first, so that the pupil is never in doubt as to the value of algebraical methods.

Graphic Algebra. (Same author and publisher.)

The lack of connection between "geometrical drawing" and ordinary mathematics will be remedied by the use of Mr. Potter's *Concurrent Practical and Theoretical Geometry.* (Ralph, Holland & Co.) Mr. Wise's *Exercises on the Metric System* (Ralph, Holland & Co.) may also be recommended.

APPENDIX II.

Aids to Nature Study.

To assist investigation and research, and for purposes of general information, classification of collected specimens and identification of the same, it will be necessary to place in the school or college library suitable works for constant reference. The following lists suggest volumes which the writer has found useful and interesting in regard to various branches of Nature study, and without the aid of which, in many cases, further progressive interests and knowledge cannot be maintained.

Reference Works.—Animal Life (General):—

Living Animals of the World. Finely illustrated by photography. (Hutchinson).

Natural History of Animals (Ainsworth Davis), or Warne's *Royal Natural History*, or Wood's *Natural History.*

Claus and Sedgwick's *Zoology* (Sonnenschein), or Parker and Haswell's *Zoology* (Macmillan). Excellent textbooks for reference in all branches of zoology.

Insect Life:—

Transformation of Insects. Simple, popular and well illustrated. (Duncan).

British Butterflies and Moths. (Furneaux. Longman).

Common British Beetles. Illustrated and popular. (Woods. Routledge.)

British Beetles. Plates. (Rye. Van Voorst).

Bees. Plates. (Shuckard. Van Voorst).

The Honey Bee. (Samuelson. Van Voorst).

Life of the Bee. (Maeterlinck. George Allen).

Aquatic Insects. (Miall. Macmillan). Indispensable as a guide to the study of life histories of water insects of all kinds (gnats, ephemera, caddis, dragon flies, beetles, etc.), including recent research-work in structure, circulation, and respiration, and containing references to Réamur, Swammerdam, Lyonnet, and other works of the deepest interest.

Injurious and Useful Insects. (Miall. Bell).

Manual of Injurious Insects, Plant Pests, etc. (Ormerod.) Life histories of aphides, gall flies, weevils, etc.; with methods of prevention and statistics of the same from many farmers, gardeners, etc.

Origin and Metamorphoses of Insects. (Lubbock. Macmillan.)

The Vivarium. (Bateman. Upcott Gill.)

Spiders, Crustaceans, etc.:—

British Spiders. (Staveley. Reeve.)

Crustaceans and Spiders. Young Collector Series. (Skuse.)

Mollusca, Shells, etc.:—

Manual of the Mollusca. (Woodward. Crosby Lockwood & Co.)

Edible Molluscs. (Lovell. Reeve & Co.)

Conchological Manual. (Sowerby.)

Reptiles and Mammalia:—

The Frog. (Sir George Mivart. Macmillan.) Popular, scientific, well illustrated life history, with references to all species and comparative estimates of the position in the group of other reptiles.

British Reptiles. Finely illustrated. (Bell. Van Voorst.)

British Reptiles. Popular account of all members, with coloured illustrations. (Cooke. Hardwicke.)

British Reptiles. Young Collector Series. (Hopley.)

Birds:—

Dictionary of Birds. Indispensable as a work of reference, and of the greatest interest. (Newton. A. and C. Black.)

Our Native Songsters. Coloured plates. (Anne Pratt. S.P.C.K.)

British Birds in Their Haunts. Woodcuts. (C. A. Johns.)

"*Bird*" books generally. Fine photographs. (Kearton.)

The Cambridge Natural History Series. In regard to information respecting the lower forms of life ranging between the protozoa and crustacea, this series offers detailed results of recent investigations in each division. (Macmillan.)

Plant Life. General:—

Natural History of Selborne. (White, ed. by Miall. Methuen).

Botanical Rambles. (John. S.P.C.K.).

Naturalist's Voyage on the Beagle. (Darwin. Dent).

Naturalist on the Amazons. (Bates. Murray).

Tropical Nature, etc. Chapter III. summarises evidences in animal and plant life of "mimicry" or "protective resemblance," of which a most interesting and useful account is given. (A. R. Wallace. Macmillan).

Island Life, Darwinism, Travels on the Amazon. (A. R. Wallace. Macmillan).

Round the Year. Short nature stories. (Miall. Macmillan).

Outdoor World. (Furneaux).

Plant Study in School, Field and Garden. (Bridges and Dicks. Ralph, Holland & Co.).

Trees, Flowering Plants, etc.

Forest Trees of Britain. (John).

Familiar Ferns. (Boulger).

Wayside and Woodland Trees. (Step. Warne).

Flowering Plants, Grasses, Sedges, Ferns of Great Britain. (Anne Pratt. Revised edition by E. Step).

Natural History of Plants. (Kerner and Oliver. Blackie).

Flora. Revised edition; 2 vols. (Bentham and Hooker. Reeve).

Flowers of the Field. (John. Routledge or S.P.C.K).

First Studies of Plant Life. Plant phenomena, fertilisation, etc. (Atkinson.)

British Wild Flowers in Relation to Insects. Cross-fertilisation. (Lubbock, Lord Avebury. Macmillan).

Insectivorous Plants. Drosera, Dionæa, Pinguincula, Utricularia. (Darwin).

The Colours of Flowers. (Grant Allen. Macmillan).

Flowers, Fruits and Leaves. Fertilisation, plant protection, seed dispersal and appliances. (Lubbock, Lord Avebury. Macmillan).

Climbing Plants, Fertilisation of Orchids. (Darwin).

Vegetable Galls, Mosses, Lichens, Fungi, etc. (Connold. Hutchinson).

British Mosses. (Stark. Reeve).

Handbook of Mosses. Young Collector Series. (Bagnall).

British Mosses. (Sir E. Fry. Witherby).

Lichens. (Lindsay. Reeve).

Fungi, International Science Series. (Cooke).

Fungi and Lichens. Young Collector Series. (Holmes).

The Seashore—Various Studies:—

Sea Anemones and Corals, coloured plates; *Marine Zoology*; 2 vols., woodcuts; *A Year at the Shore,* coloured illustrations; *Naturalist's Rambles on the Devonshire Coast* (P. H. Gosse. Van Voorst.)

A Week at the Lizard. (C. A. John. S.P.C.K.)

Things of the Sea Coast. (Anne Pratt.)

Common Objects of the Seashore. (J. G. Wood. Routledge.)

The Seashore. (Furneaux. Longman.)

The Marine Aquarium. (Bateman. Upcott Gill.)

Glaucus. (Kingsley.)

Microscopy—Pond Life, etc.:—

Micrographic Dictionary; *Aquatic Insects.* (Miall. Macmillan.) *Rock Pools.* (Scherren.) *Pond Life.* (Furneaux. Longman.) *Marvels of Pond Life.* (Slack's.)

Through a Pocket Lens; *Practical Microscopy.* (Cross and Cole.) *Handbook to the Microscope.* (L. Wright.) *Algæ.* (West. Macmillan.) *Freshwater Aquarium.* (Bateman. Upcott Gill.)

Geology, Astronomy, Mineralogy:—

Text-book of Geology; *Class Book of Geology.* (Sir A Geikie. Macmillan.)

Story of the Heavens. (Sir R. Ball. (Cassell.)

Popular Mineralogy. (Sowerby. Lovell Reeve.)

Mineralogy. (Rutley. Murby.)

Country Books, Poetry, Prose, Folklore, etc. (general reading):—

Poems. Wordsworth's, Tennyson's, Keats', Shelley's.

Seasons. (Thomson.)

Plant Lore and Garden Craft of Shakespeare. (Ellacombe.)

Folk Lore of Plants. (Thiselton. Dyer.)

Shakespeare Flora. (Grindon.)

Nature Study. Selected poetry and essays. (Dirck. Nimmo.)

The Old Red Sandstone; *My Schools and Schoolmasters.* (Hugh Miller.)

Boys' Country Book; *Common Wayside Flowers.* (Thomas Miller.)

Country Year Book. (William Howitt.)

Life of a Naturalist; *Life of Robert Dick.* (Smiles.)

Colin Clout's Calendar; *In Nature's Workshop.* (Grant Allen.)

Ornithological Rambles in Sussex. (Knox.)

Life of the Fields; *Nature Near London*; *The Open Air.* (Jefferies. Chatto & Windus.)

Parables from Nature. (Mrs. Gatty.)

A Week at the Lizard. (C. A. John.)

Leisure Time Studies. Includes an admirable lecture on the "Place, Method and Advantages of Biology in Ordinary Education." (Dr. A. Wilson. Chatto & Windus.)

Beauties of Nature. (Lubbock. Macmillan.)

APPARATUS.

Glassware:—

Aquaria, vivaria, B. cages for insects. Bell-glasses, 16 ins. across, inverted, on wooden stands; for pond life and for raising larvæ of butterflies and moths. Bell-glasses, 6 ins. high, on stands. Pneumatic glass trough, 10 ins. across, 6 ins. high; for pond weed, fish, caddis. Gas jars (wide mouths), for rearing dragon flies and other aquatic insects from larvæ. Gas jars (ordinary), for culture of acorns and seeds generally. Glass jars, funnels and test-tubes, for collecting oxygen from water-weed and for various purposes. Dipping tubes of various sizes. Watch-glasses, flat bottoms, for isolating small water animals and weed for microscopic examination.

General:—

Fish-can. Pond-life "fishing-stick" and apparatus. Tubes, 3-4 ins., in stout glass with rim, to fit fishing net, and others corked. Bottles with wide necks, corked. Bottles, wide necked, for specimens in alcohol. Lenses, pocket, folding, 1 in. focus (class work). Microscope, large stage, coarse adjustment. Objectives, 3 ins., 1½ ins., ⅔ in. Double nose piece, to carry two objectives. Glass slips, thin, ground edges. Cover glasses, ¾ in. square (or circular), No. III. Dissecting instruments (needles, knives, scissors). Dissecting needles, for class work, floral dissection. Micro tanks of various depths, for the microscope stage. Glass tank, for lantern use.

School Museums:—

Few mounted skeletons—frog, bird, bat. Shells. Life histories in alcohol, dragon fly, water beetle, newt, frog, etc.

In addition to material forming the stock museum of the school, other objects obtainable for a time on loan from appointed centres would prove a valuable addition to teaching.

A third source of supply of museum specimens is gradually formed by contributions of scholars and friends of the school; and such assorted and selected material should be given a separate exhibit in regard both to the miscellaneous nature of

such collections and also to strengthen the interest of contributors. This part of the "museum" bears valuable testimony to the intelligent interest of students and scholars, and has a proportionate and peculiar value in consequence. In the hands of a student curator it may well form a specially useful aid to the particular form of Nature Study associated with the school.

EDUCATIONAL VISITS.

1. Kew Gardens:—

Study of Trees. Summer and winter aspect, form, bark, leaves, flowers and fruits. Special: the pinetum—bark, leaves, cones.

Study of Flowers. Wild flowers under cultivation (Botanical Gardens, plantations). Alpine flowers. Flowers of different zones (temperate, subtropical, tropical).

Plants used as food, and *Economic* uses in general (wood, leaf, fruit, etc.).

Plants of Special Interest. (*a*) Carnivorous plants; (*b*) Sensitive plants; (*c*) Climbing plants; (*d*) Diminutive plants; (*e*) Butcher's Broom, British Orchids, Squirting Cucumber, Ginkgo.

Land and Water Birds at Kew.

Pond Life (tanks, lakes and moat). Fish and amphibia.

Water Plants. Buttercup (white), milfoil, anacharis, hornwort, water plantain, water lily, horsetails, bladderwort.

2. South Kensington Museum:—

Birds' nests and eggs. "Life histories" in glass cases of butterflies and moths. "Mimicry," illustrated by mounted specimens of leaf insects, stick insects, edible and distasteful butterflies, locusts, lappet moth on leaves, etc. Collected fruits (capsules, pods, berries, etc.), to illustrate dehiscence by valves, pores, splitting, etc., and indehiscent. Few examples of *wood*, showing bark, "rings" of tree, etc., long and transverse sections. (M. W. L.)

INDEX.

Accuracy, Faculty of, 130, 131, 132, 262, 394.
Accuracy and Approximation, 428.
Aesthetic Sense, 222.
Aims of Nature Study, 145.
———Drawing, 218.
———Manual Training, 249.
Air, Study of, 170.
Algebra, History, 390;
———Study of, 402.
Alphabetic Method, 303.
Analysis of Sentences, 356.
Apperception and Apperceptive Interest, 15, 48, 69, 71, 77, 78, 85, 99, 114, 132, 150, 207, 258, 298, 361.
Arms'rong, Pr f., 132.
Arnold, M., and the Bible, 11.
Art Craving of Child, 217.
Astronomy, Lack of Success, 138.
Historical Method, 139.
Arithmetic, History, 385.
———Mental, 402.
———Early Stages, 404.
———Subtraction, 408.
———Multiplication, 409.
———Division, 410.
———Vulgar Fractions, 413.
———Weights & Measures, 415.
———Decimals, 416.
———Ratio & Proportion, 419.
———Interest, Stocks, 422.
———Square Root, 423.
———Logarithms, 424.
———Mensuration, 424.
———Graphs, 426.
———Equations, 427.
———Approximations, 428.

Bible, 11.
———Reasons for Retaining, 12.
Biglow Papers, 28, 29.
Biographies, Science, 136, 161, 177.
Books of Travel, 108.
Brain Centres, 323.

Child, Art Craving of, 217.
Children and Dogma, 10.
Choice of Songs, 365, 381.
Civics and Democracy, 25.
———Literature, 26.
———History, 26, 95.
Colour, Teaching of 235.
Combustion, 169.
Composition, Oral, 315, 329.
Contracted Methods in Arithmetic, 429.
Correlation,
———in Religious Instruction, 14.
———and Reading Books, 48.
———in Literature, 72.
———History, 90, 109, 116, 200.
———Geography, 109, 115, 174, 398.
Correlation,
———Arithmetic, 115, 174, 256, 398.
———Nature Study, 116, 147.
———Science, 161, 164, 174, 176, 398.
———Songs, 200.
———Drawing, 227, 256.
———Manual Training, 256.
———Composition, 326.
———Citizenship, 399.
Courses of Religious Instruction, 18.
Cultivation of Imagination, 225.
———Dexterity, 226.

Dale Method for Reading, 299, 309.
Dangers of Questioning, 53, 61.
———Thoroughness, 70.
Dates in History, 101.
Decimals, 416.
Deduction, 162, 394.
Definitions—Geography, 111.
Democracy and Civics, 25.
———History, 83.
Dexterity, Cultivation of, 226.
Direct Moral Instruction, 34, 94.
Disadvantages of Quantitative Science, 179, 181.
Division, 410.
Dogma, 10.
Drawing, Relation to Nature Study, 157.
Drawing, History of, 218.
———Aims, 218.
———Proportion, 230.
———Perspective, 232.
———Models, 234.
———Colour, 235.
———L ght and Shade, 239.
———Mass and Outline, 240.
———Objects, 241.
———Memory, 242.
———Schemes, 247.
———Relation to Manual Work, 265.
Drudgery and Interest, 401.

Early Stages in Physics and Chemistry, 164.
Early Stages in Arithmetic, 404.
English Grammar, Its Anomalies, 350.
———Suggested Topics, 353.
———Analysis, 356.
Experiments, 179, 261.
Experimental Geometry, 430.
Expression and Impression, 59, 62, 80, 208, 220, 364.
Expression, Musical, 378.

Faculty Doctrine, 84, 130, 206, 358, 433.
Faculty of Accuracy, 130, 134, 434.
———Observation, 130, 134, 1 8, 434.
———Reasoning, 130, 134, 358, 434.
———Wonder, 135.
———Memory, 435.

Fairy Tales 82.
Fröbel and Fröbelianism, 59, 60, 71, 129, 131, 219, 255, 273, 298.
Future of Religious Education, 9.

Gardens, Interest in, 210.
———Site and Size, 211.
———Tools, 211.
———Manures, 212.
———Seeds, etc., 213.
Geography, Regional, 105.
———Source Method, 107.
———Moral Value, 110.
———Definitions, 111.
———Topical, 112.
———Geological, 113.
———Heuristic, 117.
———Maps, 118.
———Open-Air, 124.
———School Museums, 120.
Geology, 113, 140.
Geometry, 430.
Grammar, 45.
———and Speech, 45, 46.
———Incidental, 64.
———Its Anomalies, 350.
———Topics, 353.
———Analysis, 356.
Graphs, 426.

Hall, Dr. Stanley, 132.
Heat, 166.
Hebrew Poetry, 16.
Herbart and Herbartianism, 11, 32, 69, 84, 129, 131, 161, 249, 273, 298, 319, 360, 401.
Heuristic Methods in Geography, 117.
———in Science, 132, 162.
History, Relation to Civics, 26.
———and Moral Instruction, 35.
———Low Status of, 83, 86.
———and Democracy, 83.
———Great Writers, 87.
———Source Books, 89.
———Correlation of, 90.
———and Shakespeare, 91.
———Prehistoric Man, 96.
———Local, 99.
———Pictures in, 100.
———Dates, 101.
———of Drawing, 218.
———Manual Training, 259, 266.
———Needlework, 282.
———Arithmetic, 385.
———Geometry, 389.
———Algebra, 390.
Hygiene, 134.
Hymns, 81.

Ideas and Morality, 31, 32.
Imagination, Cultivation of, 225.
Impression and Expression, 59, 62, 80, 208.
Indirect Moral Instruction, 35.
Induction, 162, 395.
Interest in
———Religious Instruction, 13.
———Astronomy, 140.
———Nature Study, 160.
———School Gardens, 210.
———Needlework, 278.
———Reading, 301.
———Recitation, 339.
———Singing, 376.
———Mathematics, 397.
Isothermal Maps, etc., 120.

Kindergarten, 255.
Knitting, 290.
Knowledge and Skill, 206.

Light and Shade, Teaching of, 239.
Literature, Relation to Civics, 26.
———in the School, 44.
———and Moral Instruction, 57.
———and Style, 67.
Local History, 99.
Logarithms, 424.
Look and Say Method, 318.
Lowell, Biglow Papers, 29.
Low Status of History, 83, 86.

Manual Training, Aims, 249.
———Material, 252.
———Rooms, 253.
———History, 259, 266.
Maps, 118.
———Orographical, 119.
———Isothermal, etc., 120.
———Memory, 122.
Material for Nature Study, 154.
Mathematics in Modern Life, 392.
———Practical Methods, 400.
Method, Heuristic, 117, 132, 162.
Of Reading Lesson, 314.
Metre in Poetry, 66.
———Ignorance of, 66.
Microscope, 157.
Models, Drawing of, 234.
Moral Instruction, Direct, 34, 94.
———Indirect, 35.
———and History, 35.
———Material for, 36-42.
———and Literature, 57.
———and Poetry, 74.
Moral Value of Geography, 110.
Multiplication, 409.
Music, Function of, 362.
———Vowel Tone, 371.
———Mouth Drill, 374.
———Vocalisation, 375.
———Expression, 378.
———Use of, 383.

National Songs, 384.
Nature Study, 131, 140.
———Authorities, 143, 144.
———Aims, 145.
———Comparative Method, 147.
———Correlation, 147.
———First Stages, 148.

Nature Study Readers, 149.
———Apperception, 150.
———Schemes, 150.
———Material, 154.
———and Drawing, 157.
———Microscope, 157.
Needlework,
———History, 282.
———Early Training, 285.
———Cutting-out, 286.
———Plain, 287.
———Patching and Darning, 288.
———Knitting, 290.
Note-taking, 183, 213.

Objections to "Name" Method in Geography, 114.
Observation, 130, 131, 163.
Oral Composition, 315, 329.
Orographical Maps, 119.

Patriotism and
———Religious Instruction, 17.
———Literature, 72.
———History, 89.
Perspective, 232.
Phonetic Method, 307.
Phonic Method, 305.
Physics and Chemistry,
———Selection of Material, 163.
———Early Stages, 165.
———Heat, 166.
———Combustion, 169.
———Air, 170.
———Water, 173.
———Biographical, 177.
———Experiments, 179.
———Practical Work, 181.
———Notes, 183.
Physiology, Lack of Success, 133.
Pictures; in History Teaching, 100.
Plain Needlework, 287.
Poetry, Hebrew, 16.
———and Prosody, 66.
———Recitation, 68.
———Moral Value, 74.
———and Hymns, 81.
———and Nature Study, 155.
Practical Methods in Mathematics, 400.
Prehistoric Man, 96.
Presentational Activity, 319.
Proportion in Drawing, 230.

Quantitative Science,
———Disadvantages of, 179, 181.
Questioning, 52, 55, 118, 330.
———Dangers of, 53, 61.

Ratio and Proportion, 419.
Readers, Nature Study, 149.
Reading, Correlation, 48.
———When to Teach, 296.
———Dale Method, 299, 309.
———Alphabetic, 303.
Reading, Phonic, 305.
———Phonetic, 307.
———Look and Say, 308.
———Sonnenschein, 312.
———Lesson Method, 314.
Reasoning, 130, 131.
———Inductive and Deductive, 162.
Recitation, Selection of, 71.
———Proper Use of Voice, 337.
———Importance of Rhythm, 341.
Regional Geography, 105.
Religious Education, Its Future, 9.
———Correlation, 14.
———and Patriotism, 17.
———Suggested Courses, 18.
Rhythm, 341, 366.

Schemes, Religious Instruction, 18.
———Nature Study, 150.
———Drawing, 247.
School Museums and Geography, 126.
———and Nature Study, 153.
Science, History, 129.
———Correlation, 161.
Scientific Method, 360.
Scrappiness, 15, 48, 50.
Selection of Recitation, 71.
Self Activity, 131.
Self Expression, 59, 62.
Sense Training, 250.
Shakespeare, 49, 58, 61, 67, 72, 78.
———and History, 91.
Songs, Correlation of, 200.
———Value of, 204.
———Choice of, 365, 381.
Sonnenschein Method, 312.
Source Books in History, 89.
"Source" Method in Geography, 107.
Speech and Grammar, 45, 46.
Square Root, 423.
Stanley Hall, Dr. 132.
Style in Literature, 67.
Subtraction, 408.

Teaching to Think, 54, 55, 62, 130.
Thoroughness, Dangers of, 70.
Topical Geography, 112.
Training of Aesthetic Sense, 222.
Travel, Books of, 108.

Use of Biographies in Physiology, 135.
Use of Biographies in Chemistry, 161.
Use of Music, 383.
Use of Voice in Reciting, 337.

Value of Songs, 204.
Vocalisation, 375.
Vowel Tone, 371.
Vulgar Fractions, 413.

Water, Study of, 173.
When to Teach Reading, 296.
Wonder, Faculty of, 135.
Word-building, 320.

Printed by HENRY PALMER & Co., *London*

RALPH, HOLLAND & CO.'S Publications.

HAYWARD'S EDUCATIONAL SCIENCE SERIES. - - -

VOL. I., entitled—

The Meaning of Education as Interpreted by Herbart.

Cr. 8vo, cloth, 2/- net; post free, 2/4.

Many questions dealt with in Vol. II. receive here fuller elucidation, and the appendix of pedagogical terms is almost indispensable to Students.

VOL. II.

The Primary Curriculum.

This book will be found especially suitable for teachers preparing for the Certificate Examination, and is also designed to take the place of a general manual of school work.

The book will be found to be eminently practical and full of concrete suggestions applicable to present day class-room practice.

Every important reform of method likely to take place in the next twenty years finds a mention and, in most cases, a copious treatment in this book.

Cr. 8vo, cloth, 473 pp.,

4/- net; post free, 4/4.

***In the Press*—**

VOL. III. will deal with DISCIPLINE, ORGANISATION, and TIME TABLES; with certain PROBLEMS of PSYCHOLOGY, HEREDITY, and CHILD STUDY; and with various other educational questions that are coming to the front. The INFANT SCHOOL and the EVENING SCHOOL will be also dealt with in the light of the most recent psychological research.

LONDON: RALPH, HOLLAND & CO.,
68 & 69, Temple Chambers, E.C.

100529

Educat
Teach
H

Author Hayward, Frank Herbert

Title The primary curriculum.

DATE. | NAME OF BORROWER.

University of Toronto
Library

DO NOT
REMOVE
THE
CARD
FROM
THIS
POCKET

Acme Library Card Pocket
Under Pat. "Ref. Index File"
Made by LIBRARY BUREAU